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KENTUCKY'S EARLY LITHOTOMISTS

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THE writing of biography requires special talents which very few possess. A very brilliant essayist, who happens to be of our profession, has this to say of biography:

> Biography is the story of a life, told by a man who lived it, or by a student of it. Biography does not consist solely of a record of events or adventures that constitute the actual and visual side of existence. It is not merely a chronological narrative of happenings from which the reader may divine the inner and hidden qualities of the subject: it is primarily a statement of the subject's thoughts and strifes, ambitions and realizations—and as thoughts and ambitions condition action, behavior and achievement, that which we call the "life" of a man flows from them. Biography presents a picture of a mind, a soul, a heart; of an environment; of successes and failures that make or seek to make the subject immortal.

When one prescribes such conditions for biography it need not be said that there are few which meet all, or even a few, of this essayist's requirements.

Physicians have achieved much in this world, but none has seen fit to write an autobiography which would portray for us the thoughts which preceded one's epoch-making discoveries or deeds. Unfortunately the world has had but one Boswell. It is to be regretted that some of our medical pioneers did not have such an alter ego.

The men whose lives I have chosen to remind you of this evening were Kentucky's first surgeons and they distinguished themselves in that branch of surgery which today is called urologic surgery; though one's title to immortality was merited by his labors in another branch of surgery—they are Ephraim McDowell and Benjamin Winslow Dudley.

To have a proper conception of the greatness of their accomplishments it is necessary to have a mental picture of the field in which they were done. Both began their life's work in the closing

years of the eighteenth century, and this was practically simultaneous with the birth of the State of Kentucky.

Probably the first white man to set foot on Kentucky soil was La Salle, the explorer of the Mississippi River. It is thought that in 1669 or 1670 he came through part of Kentucky from the extreme eastern boundary to the falls of the Ohio. There was a long period between this time and the advent of another white man, for the next one to come was Doctor Thomas Walker who in 1750 made exploring expeditions from his home in Virginia to the eastern section of Kentucky.

In 1769 John Findley piloted Daniel Boone through a gap in the Cumberland Mountains to the Kentucky which was then a part of Virginia. Findley had gone through the gap several times as he had made trips to trade with the Indians. It was not until 1775 that permanent homes were built in Kentucky, though in 1773 Colonel James Harrod had built a cabin at the place now called Harrodsburg.

McDowell and Dudley were known as lithotomists since their outstanding achievements were the removal of stones from the bladder.

Urologic surgery was perhaps the first surgery known. The sacred writings of the early Hindus attest the fact that surgery of the genito-urinary tract was in common practice centuries before the coming of Christ. The antiquity of circumcision is an example of early surgery of this type.

The Ayurveda which was written between the sixth and third centuries before Christ speaks of treating strictures by gradual dilatation done with wooden or quill instruments, practiced every third day. It also speaks of the treatment of urethritis by injections.

The operation for stone in the bladder is thought to have originated in India, as lithiasis was very common in that country. From India the practice of lithotomy spread to Greece, thence to the remainder of Europe. Hippocrates described the formation of stone in the bladder, declaring that it gradually enlarged from a nucleus.

In Italy during the middle ages there were many traveling stone extractors. These men were not physicians, but learned to remove bladder stones as a trade, and like some of our present day tradesmen refused to teach their trade to anyone outside their immediate family. So prevalent must have been the disease of stone in the bladder that some of these wandering lithotomists were salaried by municipalities.

The operation done by Kentucky's early lithotomists was called a lateral lithotomy. This operation was devised in the year 1697 by a strolling incisor named Jacques de Beaulieu, or Frere Jacques. The technic was modified by William Cheselden (1688-1752) who on March 27, 1727 performed an operation which had its inception in the Jacques operation. The lateral lithotomy has passed from general usage, and one cannot help wondering why, for with this operation, done prior to the era of aseptic surgery, almost unbelievable mortality statistics were given. Suprapubic cystostomy has replaced Cheselden's operation. The first suprapubic operation for this condition was probably done by Pierre Franco in 1556.

A lateral lithotomy is performed in the following manner. A curved urethral sound is passed into the bladder and held there while the patient is put in the lithotomy position, the staff of the sound is then held nearly parallel to the abdomen by an assistant: this causes the membranous urethra to be recognized more easily. The incision is made beginning at a point 1/3 inch to the left of the median perineal raphe at a point 1¼ inch to 1½ inch anterior to anus. At the point of starting the incision the knife is thrust deeply until it encounters the urethral sound. The incision is then carried outward and posteriorly to a point midway between posterior margin of anus and ischial tuberosity. This incision is usually from 2 to 3 inches in length. Besides the superficial structures cut in this incision the following deep tissues are severed—membranous and prostatic urethra, deep layer of the triangular ligament, compressor urethrae muscle anterior portion of the levator ani muscle, and left lateral lobe of the prostate gland. Through such an opening the index finger of the left hand is inserted to the bladder, the stone located and forceps for removal are inserted with the right hand. The dexterity of the English surgeons in doing this type of operation becomes evident when one reads that John Bell who was McDowell's instructor at Edinburgh frequently removed a stone in eight minutes; even with such rapidity he could not attain the record of Cheselden who was known to have removed a stone in this way in three minutes.

The factors which magnify the achievements of McDowell and Dudley are: the state of development of the community in which they were done; the degree of professional ability common to their vicinity; and heights reached by surgery throughout the world at their time, which was the pre-anesthetic period. McDowell and Dudley began their professional careers at a time when the communities in which they practiced were still subject to attack by the Indian savages, mostly from the North of the Ohio River.

Ephraim McDowell's birth occurred in Virginia four years before a permanent home had been built in Kentucky. He was born on November 11, 1771. Thirteen years later he came with his father to Kentucky and settled at Danville after a trip which was very hazardous due to the danger of attack by Indians.

His progenitors were Scotch, though they came to America from Ireland where the family had been placed by the British government on confiscated land.

His father realized the value of an education for he sent his son to the best schools the new country afforded. He received the major portion of his education at the school of Jones and Worley at Lebantown, now called Georgetown, situated twelve miles north of Lexington. This school was large enough to accommodate fifty or sixty pupils; had courses in Latin and Greek, the sciences usually taught in first class seminaries. The tuition was 25 shillings a quarter. The board, washing, and room rent were £3, or 5 hundredweight of pork on entrance, and £3 at the beginning of the third quarter. Each student had to furnish his own bed, or pay 35 shillings a year to have one furnished.

Following his course at Jones and Worley's McDowell spent two or three years as an apprentice in the office of Dr. Humphrey at Staunton, Virginia.

At the age of 22 years he went to Edinburgh where he was a student at the University during the years of 1793 and 1794. While in Edinburgh he attended the lectures of Dr. John Bell, who was not connected with Edinburgh University, but held private classes. It was Bell more than any other who influenced the future of McDowell.

Bell was born in 1763 and died in 1820. He was a great anatomist and artist, his papers on anatomic subjects being beautifully illustrated by himself. He was a finished surgeon; and with Desault and Hunter is considered the father of vascular surgery. He was a very forcible speaker. Bell spent much time lecturing on stone in the bladder. He told his pupils that this condition was found most frequently in persons residing in a limestone country. McDowell's interest was aroused because his section of the country at home was of such substructure. He saw Bell operate twice for vesical calculus—no doubt with McDowell, as with many another pupil of some great teacher, the imprint left by the teacher is not the actual knowledge imparted, but the inspiration which quickens a native talent to develop and accomplish, sometimes, even greater things than the generator of that inspiration had ever done.

McDowell returned from Scotland and began the practice of medicine at Danville in 1795. This was just three years after Kentucky was admitted into the Union. It was but natural that he soon acquired a large practice. The people were quick to realize that a man who had had two years study abroad was superior to the doctors in the vicinity, many of whom had never attended even the best schools in this country.

He was a student in the sense usually applied to a physician, that is he read the books and periodicals then available. He soon became known as the best surgeon west of Philadelphia. He was strong in his convictions, an enemy of quacks and charlatans, and would refuse to meet in consultation any man whose ethics were open to criticism. His enemies were begotten of jealousy. It is said of him that he had a great memory for names and faces, a fortunate faculty for any physician to possess.

His habits were exemplary. He did not use profane language; did not use tobacco; and used alcoholic beverages only after unusual exposure. He was quiet and unassuming, and had an attractive personality.

At the age of 31 he married the daughter of Isaac Shelby, Kentucky's first governor.

McDowell came from a family of Presbyterians, and strict ones. Though of exemplary habits and religious inclinations he did not join any church until after his marriage, when he embraced the faith of his wife, becoming a very devout and active member of the Episcopal Church. He donated the ground upon which the present Episcopal church of Danville stands.

McDowell is best known as the first man to remove an ovarian tumor successfully, but he was a well known surgeon before that time. His epoch-making operation was done in December 1809, and two years prior to it he received a diploma from the Medical Society of Philadelphia, the most select medical society of the day, but it was not until 1823 that he received the degree of Doctor of Medicine, an honorary one from the University of Maryland.

In 1812 he operated upon James K. Polk, for vesical calculus. Polk was then 17 years old. Even after Polk became a resident of Washington he would write McDowell assuring him of his gratitude for the relief he received from his operation; a tribute to surgeon and patient.

McDowell performed 28 lithotomies without a death. This in a day when anesthetics were unknown, when a surgeon was left entirely on his own resources, for traveling was a great under-

taking and a man of McDowell's type had no consultant to whom he could appeal for aid, as there was no man within reach who had attained a skill comparable to his own.

The later years of McDowell's life were spent on a farm near Lexington, and even in those days the bluegrass region was noted for its beautiful farms. He died June 20, 1830. His death being due, according to the physicians attending him, to acute inflammation of the stomach. One might conjecture almost endlessly as to what pathologic process brought to an end the life of this man who was one of the outstanding men of medical history of all time. In his death Kentucky, more than the rest of the country, lost an invaluable asset, but his successor was in the making long before he passed behind the curtain of death. His place as the most able surgeon west of the Alleghenies was immediately taken by a surgeon of Lexington, Dr. Benjamin Winslow Dudley.

Dudley was born in Spottsylvania County, Virginia, April 12, 1785. His parents moved to Kentucky soon after his birth, thus he came to this state a couple of years after the arrival of McDowell. His father was a Baptist minister, widely known, esteemed, and the possessor of a reputation as an orator. Dudley went to the neighboring schools and for a while worked in one of the stores of Lexington. Later he began the study of medicine in the office of Dr. Frederick Ridgley. Ridgley was considered a learned man of his time and was very careful in his efforts to impart his knowledge to young Dudley. Dudley started his medical studies at a very early age, so that his childhood merged into manhood without the intermediate stage of youth.

Dudley was a man of average height, erect, and fair complexion. He possessed a pleasing voice: which is an asset to none more than it is to a physician. He must have been somewhat pompous, as one historian says that he was exceedingly polite and used the broad "a," an accent which surely must have been foreign to Kentucky in his day. He was distant, making friends slowly, but retaining them once they were made. He belonged to no secret societies, and to no church, though he kept a pew at, and attended the Episcopal church when possible. When 36 years old he married a Miss Short, and from this union there were three children.

Dudley's medical education was ideal. Even at this date it would be considered excellent from a purely clinical aspect. After serving as an apprentice in the office of Dr. Ridgley he entered Transylvania Medical College which was then in its infancy having been started in 1799. In 1804 he went to Philadelphia, and was graduated from the University of Pennsylvania in 1806—just two weeks

before he reached his majority. He came immediately to Lexington to begin practice and opened a one-room office for that purpose. Success was not long in reaching him—for in 1810 he had completed plans to take a postgraduate course in Europe.

In our day we hear much of one's working his way through college, but we need not delude ourselves into believing that this is a result of a modern love of education, or a condition unknown to those of a century ago. Dr. Dudley's method of financing his postgraduate study was unique and showed the courage with which he was endowed, which courage later proved a valuable asset in the many professional problems which he encountered.

He bought a flatboat, loaded it with produce and floated down the Ohio to the Mississippi River and on to New Orleans. At New Orleans he sold the boat and its cargo, and re-invested in a cargo of flour. He billed this to Gibraltar, and with it reached his destination sometime in 1810. He sold his cargo at Gibraltar and Lisbon at a large profit. With the funds he hurried through Spain and France to Paris. He was now at the fountain head of surgical wisdom. While in Paris he had the good fortune to hear Baron Larrey tell of his military experiences. Larrey was Surgeon in Chief of the Armies of Napoleon; was one of the first to amputate the leg at the hip joint; and he is said to have done 200 amputations in 24 hours.

Dudley had the good fortune to be present in the Chamber of Deputies when Napoleon came to report his disastrous Russian Campaign, which report he began with those words which are indelibly written on the pages of history: "The Grand Army of the Empire has been annihilated—."

Dudley remained in Paris for three years and then went to England to study the methods employed in the great hospitals of London. He had the opportunity of hearing Abernethy who was considered the most dramatic teacher of his time, and of seeing Sir Astley Cooper operate frequently. The latter he considered the most skilled and graceful surgeon of his day. It might be of interest to state that Cooper was a great believer in the value of a knowledge of anatomy. He was a tireless worker and it was his practice to do some dissecting every day. He would arise at 6 a. m. every day and dissect until 8 a. m., when he would have his breakfast. Part of the afternoon was spent in the dissecting room with his students. Even when away from home he had to do his daily dissecting, and this necessitated the payment of fabulous sums to bodysnatchers.

Dudley had the advantage of study under these two exponents of the two methods of teaching. Abernethy the champion of the didactic method, and Cooper the teacher who insisted on actual demonstration in the sick room, operating room, or dissecting room.

After four years in France and England, Dudley received an honor rarely coming to American surgeons, that of becoming a member of the Royal College of Surgeons.

When he had finished his postgraduate work he spent six months traveling in Italy and Switzerland. Surely such a trip was an asset to him later for it added to his standing as a cultured gentleman, a position to be striven for by any young professional man.

While in Europe Dudley had collected some rare books and instruments, together with some rare mineral specimens, and these were in the Customs House at London when that structure was burned. He lost all his treasures.

In 1814 he returned to Lexington, Kentucky, and immediately began the practice of medicine. His success was almost instantaneous, and he soon had a national reputation. He was made the head of the Medical Department of Transylvania University in 1817 and was appointed to fill the chair of anatomy and surgery.

His manners were those of a Frenchman, while his surgical methods were the result of the English influence. He was very dignified and serious at all times: had no gifts as a speaker, but his great earnestness and directness made him an able teacher, and his presence on, and at the head of, the faculty of Transylvania brought nation-wide recognition to his school.

The general public held Dudley in the same high regard which his students did. His patients came from far and near; some coming from Europe.

While professor of anatomy and surgery in 1818 he got into a misunderstanding with Dr. Daniel Drake over a postmortem examination done on the body of a man who had been shot. Dudley, tired of carrying on their controversy with pen and ink, finally challenged Drake to a duel. Drake declined, but his friend Dr. Wm. H. Richardson accepted in his stead. The duel resulted in Dudley's shooting Richardson in the groin. The victim bled profusely and Dudley by thumb pressure controlled the hemorrhage until the vessel could be tied. He saved Richardson's life and the two were warm friends for the remainder of their lives.

Dudley wrote very little. The first publication of the Transylvania Journal of Medicine contained an article by Dudley on the cause and treatment of epilepsy. He believed this condition resulted

from fracture of the skull, and that it should be treated by trephining. He operated upon five successive cases, all resulting in cures. He was very fortunate in not picking the idiopathic type of epilepsy.

Dudley did, as all other physicians of his day, both general practice and surgery, but he let everyone know that he preferred surgical cases.

In the day of Kentucky's first surgeons the most prevalent condition requiring surgical treatment was vesical calculus. Kentucky is said to have had more cases of stone in the bladder than the rest of the country combined. The limestone foundation of the then settled part of Kentucky was probably the cause of this condition.

Dudley was not only the foremost lithotomist of his time in Kentucky, but in the world. A prominent New York surgeon came to Lexington to see Dudley do some lateral lithotomies. Dudley did three for him and they were done so rapidly that the visiting surgeon said that had he turned his head he would have missed the whole operation.

In his life time Dudley operated upon 225 cases of stone in the bladder, with three deaths. Such a record could not be improved upon today. When one considers the fact that in the days when this State was young and its surgeons great, in every case of vesical calculus operated upon the diagnosis was made from the history and the passage of the sound, the number of cases operated upon is noteworthy. Had the x-ray been in use in Dudley's time we would probably be reading of 500 or more cases instead of 225.

In 1850, when 65 years of age, he retired from practice and from his teaching positions at the medical school. He had amassed a fortune from his practice. He was known to be very lenient with the poor, but when working for the wealthy they paid him handsomely. When he retired in 1850 he went to live at Fairlawn, his beautiful farm near Lexington. He lived twenty years after his retirement, and died on January 20, 1870, after an illness of ten hours.

These two outstanding men had lives that were full. McDowell died at a comparatively early age—59—yet he had witnessed the opening of a country which had to be won from a savage race. He not only was a witness to the rapid changes in Kentucky in the first quarter of the nineteenth century, but he witnessed the struggles of this country during the years soon after its formation. He had done his part towards bringing renown to his country as a result of his industry and talents.

Dudley's span of life covered a most interesting period in the science of medicine. He had the same opportunity possessed by McDowell: to see the early development of the commonwealth of Kentucky, but he had much more for he died just 40 years later than McDowell. He was still a practicing surgeon when ether came into use as an anesthetic, since Crawford W. Long used it the first time in 1842. Lister began the antiseptic era of surgery five years before Dudley died and it is natural to assume that a man of Dudley's mental attainments was a most interested observer of the infancy of modern surgery, and died knowing those who followed him would have a more roseate path to tread than that which he faced. The final years of his life saw his country go through a terrible civil strife and the trials that this strife caused for years after its settlement.

To my mind the most valuable lesson we might learn from the lives of these two men, and the success they made of their lives, is the value of preparation. They were endowed by nature with foresight and intelligence and they prepared themselves for the opportunities they felt would be theirs were they capable of utilizing them. They both had good training in the profession they were to follow. McDowell, whose medical education was purely a practical one, save for the theory he had culled from the books of Doctor Humphrey, soon realized that to be a success he had to seek knowledge from those who were especially fitted to impart it. He probably saw from experience that to be self-taught is to be poorly taught, for the weakest link in the chain of self education is the danger of such a pupil's making a mistake and then continuing to make it because it is not recognized as an error. He went to the place he thought had the most to offer him. He was fortunate that the surgical leadership of the world had been wrested from France by a people who spoke his tongue; this condition being largely due to the eminence attained by John Hunter (1728-1793).

What percentage of the graduates of medicine of this day can boast of a better postgraduate training than that of Dr. Dudley. In his medical education he clearly shows his courage and foresight, two attributes that were largely responsible for the prominent position he reached. He began his medical education in the office of a practitioner in Lexington. Later he entered Transylvania Medical School. With his growing knowledge of medical education he must have come to the conclusion that an older, more established school would be a better place to go for a thorough medical education. Consequently he went to the University of Pennsylvania. The University of Pennsylvania was the oldest medical school in the United States, dating from 1765 when it was

founded by Doctors Shippen and Morgan. At the time Dudley was a student there the surgical department was under the guidance of Philip Syng Physick (1768-1837) who has been called the father of American surgery.

Upon the completion of his studies at Pennsylvania Dudley had to do what many a one since his time has been forced to do: he had to get into active practice immediately because of the state of his finances, but this did not thwart his ambition. He kept before his mind the goal for which he was striving, pre-eminence in his profession. As soon as the financial difficulties had been overcome he lost no time in resuming his medical education. He spent three years with the master surgeons of France. Dudley's education had been a more thorough one than McDowell's, and while his biographers do not state it, he must have been able to converse in French, else he would not have spent such a long time in a country the language of which he could not understand. Before coming home he wanted to get some idea of the British School of Medicine. He must have found conditions in England ideal for his needs, as he spent a year in that country. One would have expected him to go to Edinburgh because of the influence the university of that city had upon his alma mater. Both Shippen and Morgan, who founded the University of Pennsylvania, were graduates of Edinburgh—as was Physick, the foremost American surgeon of Dudley's school days.

In the lives of these two Kentucky pioneers we have shining examples of the value of a thorough education and training. Professional and material success was not long in reaching them and it remained with them until the close of their careers. These two well prepared surgeons did not come home and seek some large city in which to practice their profession. Each went to the place in which he was reared. The success that they attained would lead one to believe that they were believers in the thought so impressively expressed by a later philosopher:

> If a man write a better book, preach a better sermon, or make a better mouse-trap than his neighbor, though he build his house in the woods, the world will make a beaten path to his door.

TREATMENT OF THE RETAINED TESTICLE

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THERE remains a general lack of agreement as to the management of the retained testicle. What is considered the best form of therapy, endocrine, surgical or a combination of these methods? If endocrine products are employed, what age is considered ideal to initiate treatment? Are there any harmful effects of the hormone on either the undescended testicle or the one in normal position in the scrotum? Do harmful constitutional changes occur by employing powerful glandular products? What results should one expect? At what age should surgical treatment be instituted? Is it fair to assume that the possibilities of a normal ultimate function are enhanced the earlier the testicle is located in the scrotum? What form of operation provides the best anatomic and functional results? Does normal spermatogenesis take place following successful replacement? Does neoplasm develop more frequently in the undescended testicle? Is the predisposition toward neoplasia diminished by reduction to normal location in the scrotum? In what percentage of untreated cryptorchids will the testes descend spontaneously at puberty? Is there any justification for performing orchidectomy in certain of these cases? Should glandular therapy be employed preliminary to and as an adjunct to surgery? Is surgical treatment indicated in cases beyond the age of 17 or 18 years?

The literature seems to contain confusing information. There are few truly critical and unbiased studies. Inasmuch as the incidence of cryptorchidism is estimated at 1.7 per cent, the importance of a true evaluation of the methods employed and present tendencies in treatment is obvious.

THE HORMONAL TREATMENT

This form of therapy has many enthusiastic advocates. The attempt to cause descent of the testicle into proper position in the scrotum by the use of gonadotropic hormones has been made by many. Products derived from the anterior lobe of the pituitary gland, chorionic gonadotropins and certain water-soluble substances obtained from the urine of pregnant women have been employed. The percentage of successful results has varied widely. For example, Webster in 1935 reported descent in 90 per cent of cases. The same year Spence and Scowen had 55 per cent success. In 1937, Cramer claimed 71 per cent good results. In the face of these reports, even though the potency of the endocrine products has increased and dosages have become greater, Thompson's series in 1938 designated

only 19 per cent as successful. In an even more recent study, Wohl reported "no success with endocrine therapy in causing a unilateral retained testicle to descend into the scrotum." This result obtained regardless of the use of large or small dosages. It was observed that most of the reports in the more highly successful series concerned studies in the preadolescent ages. In addition, little attention was paid to pseudocryptorchidism in differential diagnosis. Would a large percentage of these boys, if left untreated, have experienced spontaneous descent at the time of puberty? Johnson studied a group of cases of underprivileged children, between 1931 and 1937. He encountered 544 cases of cryptorchidism in examining 31,609 boys between 7 and 17 years of age. This is an incidence of 1.72 per cent or 17 cases per 1,000 boys. After the first world war, the published statistics from the U. S. Army showed 2 cases per 1,000 recruits. How then does one account for the difference, 15 cases per 1,000? The Army figures were derived prior to our knowledge of hormone therapy. Certainly the discrepancy could not have resulted entirely from the fact that 15 per 1,000 had had surgical correction. The answer is that in Johnson's series of 544, 300 cases of retained testicle underwent spontaneous descent even though no treatment whatsoever had been administered. Two hundred twenty-five of the 300 were between 11 and 15 years of age. These years are the adolescent ones when the pituitary gland is elaborating its hormone. The natural conclusion is that glandular therapy before puberty may produce descent, but in a relatively large percentage of cases is unnecessary. There is sufficient quantity of hormone produced physiologically at puberty to cause spontaneous descent. In spite of this discouraging feature of hormonal therapy, there are some cases where this type of treatment seems indicated. Froehlich's syndrome occurs in association with cryptorchidism in 5 per cent of all cases of retained testicle. This pathologic syndrome results from true gonadotropic deficiency. The most successful constitutional and local affects of endocrine treatment obtains in these cases. However, constitutional success by use of gonadotropins is also obtained in treating Froehlich's disease when there is not an associated cryptorchidism.

In discussing hormonal therapy, one should consider the possible harmful effects of injecting these highly potent chemicals. Eisenstadt, Appel and Frankel made a large series of rats unilaterally cryptorchic on their thirtieth day of life. The animals were then subjected to hormonal therapy. Control series were run. Six weeks following the last injection of anterior pituitary-like substance, the rats were sacrificed and both the artificially retained and the normally situated testicles were studied microscopically. They report

no influence of the pituitary product on the normally situated testicle. However, in the cryptorchic testicle, the capsule showed thickening. There were adhesions between the parietal and visceral layers of the tunica vaginalis. The interstitial cells showed much edema and increase in vascularity. The epithelium of the seminiferous tubules was most striking. There was a decrease in the number of elements and a failure of development. Mature spermatozoa were completely absent. Some of the tubules showed complete hyalinization. These authors conclude that there is definite danger of total degeneration of the cryptorchic testicle after the use of the hormones.

In addition to the foregoing danger, the constitutional side effects may be pronounced. Thompson and Heckel reported changes simulating premature puberty in three boys. Many enthusiastic advocates of hormone therapy state that enough of the product must be given to cause precocious and premature sexual development. Powell reported a case of hypertrophy of the prostate developing in a boy of 17 years following treatment of undescended testes with an anterior pituitary-like gonadotropic substance. Following cessation of treatment, the prostate returned to normal size. This observation was then confirmed experimentally on rats.

Glandular therapy has the virtue of enlarging the testicle and cord. Thus, when contemplating surgical correction, hormonal treatment may be given in sufficient dosage to accomplish this enlargement. As a result, the technical difficulties encountered at operation are decreased. Usually, the amount of hormone required to produce the enlargement is insufficient to cause the harmful local or constitutional changes.

In summary therefore, the treatment with hormones for the undescended testicle is characterized by uncertain and equivocal results. Also, the local and side effects may be harmful, tending toward the opinion that this form of treatment is unnecessary and should be discarded.

The Surgical Treatment

For an orchidopexy to be considered successful, the testes must ultimately be mobile, lie in the most dependent part of the scrotum and develop to normal dimensions. Let us examine some of the end results of the operative treatment as judged by the above criteria. Wilson reported 35 successful results out of 51 operations, 68 per cent; seven cases improved, 14 per cent; and 9 cases failed, 18 per cent. In Johnson's series, there were 87 per cent of improved and good results and 13 per cent of failures. Results reported by Counsellor and by Walters and Thiessen showed good to excellent

achievement in 92 per cent. Eisenstadt reported success in 87 per cent of cases. With the modern improvement in the technic of the operation and the selection of patients at a correct age, one can expect good results on an average of 85 per cent of the cases.

In a study covering 544 cryptorchids, spontaneous descent without therapy occurred in 313 cases. One hundred seventy-four of this number came to occupy a normal position in the scrotum between 11 and 13 years approaching the age of puberty when the hormones are physiologically elaborated. In other words, of 313 cases of spontaneous descent, 306 had occurred between the seventh and the sixteenth birthdays. This would suggest that the proper age at which to perform orchiopexy is the sixteenth year. This permits the individual an opportunity to respond to his own hormones. Many authors favor 9 to 11 years as the age most suitable to operate. It is obvious that many unnecessary operations have been performed. The physician should restrain his desire to do something. He should exercise patience and afford the testicle an opportunity to descend spontaneously. It has been estimated that 85 per cent of cases of cryptorchidism have an associated hernia which would require surgical repair. As long as herniorrhaphy is required in 85 per cent of cryptorchids, why delay operation? It is difficult to diagnose the hernia in the case of the retained testicle except at the operating table. Therefore, in 15 per cent of cases where hernia does not occur, spontanous descent may take place and an unnecessary operation would have been performed. Secondly, it is a much more simple surgical procedure to execute a herniorrhaphy in the case of the testicle which has already descended than to do a combined hernia and orchidopexy. It is my opinion that it is wise to await the sixteenth year for spontaneous reduction. At this time a diagnosis of hernia, if present, can be made and operation performed. In those cases which do not experience descent by this age, the hernia repair can be attended during the orchidopexy.

Bevan was first to describe the technic of operation in 1899. He enunciated the principles of the freeing of the testes, of separation of adhesions about the vas and vessels of the cord and of an adequate fixation of the testis in the scrotum. Many improvements and variations in technic have since been made, but the principles remain. He obtained fixation of the testicle in the scrotum by means of a purse string suture closing the isthmus of the scrotum. The now popular Keetley-Torek procedure transplants the testes to the most dependent part of the scrotum. Fixation is obtained by suture of the testicle to the fascia lata in the upper part of the thigh. This hook-up remains for 3 to 6 months permitting the cord to obtain proper length. The testicle then is detached and transferred back

to the scrotum. This operation or a modification has proven most satisfactory. When sufficient length to the cord can be obtained, fixation may be accomplished by means of a tense elastic band between the gubernaculum and the thigh. Thus, it may not be necessary to suture the testicle to the thigh. When the cord seems tense, the Torek operation usually results in sufficient lengthening to produce good results. The occasion will rarely arise where sufficient length of cord to place the testicle in the scrotum cannot be obtained. At such a time should one consider doing an orchidectomy? Conservation usually pays dividends. It seems worth while to preserve the endocrine function of the testicle even though spermatogenesis does not occur. This may be accomplished by transplanting the organ beneath the skin of the abdominal wall.

About 10 per cent of those afflicted with cryptorchidism do not consult the physician until they are older than 17 years. By this age the pubertal changes have been completed. The probability of degeneration of the testicle has greatly increased. Even if the organ could be successfully reduced the degree of function of spermatogenesis and male hormone elaboration are negligible. Under this set of circumstances is there sufficient justification to operate? A large percentage of these patients are embarrassed and mentally perturbed over the apparent abnormality and interference with their manhood. The condition often assumes large proportions in the minds of the victims. Surgical reduction allays these aberrated thoughts. Then there is always the possibility that some function may still exist in the organ. In addition, a possible tumor of the testicle could be diagnosed earlier with the organ in the scrotum. Therefore the surgical correction in this age group seems indicated.

The question as to what percentage of successfully reduced cryptorchids by either endocrine or surgical measures are productive of spermatozoa must remain unanswered. There have been no formal studies performed on this problem.

What is the possibility and incidence of tumors of the testicle among cryptorchids? Gilbert, in a very careful study, showed that the incidence of testes cancer is 48 times higher in cases of retained testicle than in the testes normally situated. He also showed in cases of unilateral retention that 98 per cent of testes cancer will occur in the ectopic organ. In addition, men with bilateral cryptorchidism and cancer in one testicle, developed cancer 25 times as often in the other testicle as cancer developed in one organ when both testes were in the scrotum. Even more interesting is his observation that replacement of the ectopic testicle to the scrotum does not act as a prophylaxis against the development of cancer.

The incidence of cancer testes following orchidopexy is as high as in those left in abnormal position.

A Case of Bilateral Intraabdominal Testes

History: The patient was 17 year old white male. He stated that he had never observed testicles in either scrotum since birth, nor had he ever been able to feel them in the inguinal canals. He shaved about once a month, but he had only started shaving about two months previously. The character of his voice changed when he was 15 years old. He had sexual desires and was capable of obtaining an erection; there was a history of occasional masturbation. He had received no treatment. He was never given any injections of hormone.

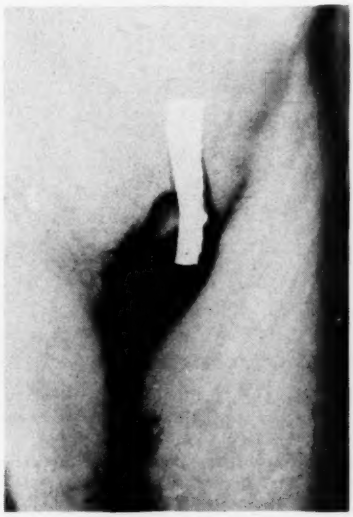

Fig. 1.—The empty scrotum of a boy of 17.

Physical Examination: He was 5 feet 11½ inches tall, weighed 160 pounds. His voice was characteristically male. The beard was scanty. The shoulders were broad, and the hips narrow; there was a typical male body configuration. The skin did not show any tendency toward a female texture. The extremities had a normal angulation at both the elbows and knees. There was a good quantity of pubic hair which was male in type.

Special Urologic Examination: The penis was normal in size, shape. There was no suggestion of infantilism. The scrotal skin was present, but empty, shriveled and rudimentary. Careful examination in both the supine and standing postures did not reveal evidence of testicles in either inguinal canal. No hernial impulse could be elicited from either side. The prostate gland was normal in size, shape and consistency. Both seminal vesicles were readily palpable and normal.

Laboratory Examination: Urine—entirely negative. Semen analysis: volume—3.2 cc.; viscosity—normal; turbidity—slightly diminished; micro-

scopic examination—no spermatozoa, either motile or immotile. The fluid resembled normal fluid from the prostate gland. Blood Wassermann—negative.

OPERATION: A right orchidopexy was done using the Torek technic. The wound healed by primary union. Two weeks later a left orchidopexy was performed in the same manner. In each instance, the testis was found floating on a mesentery within the peritoneal cavity in the iliac fossa. There were also found a hernia sac and very dense fibrous adhesions within the tissues of the sac. The relation of the testicle to the epididymis and vas deferens on the right side was normal. However, on the left the epididymis was entirely detached from the testicle except at the upper pole. This attachment was loose.

Fig. 2.—The testicles, having been removed from the pelvic cavity and placed in their normal position, have been anchored to the fascia lata according to the Torek technic.

It was joined to the serosa of the visceral layer of the tunica vaginalis by a thin fibrous cord. In addition, the vas deferens emerged from the pelvis but gradually diminished in diameter and ended blindly as a thread of fibrous tissue buried in the wall of the sac of the hernia.

In the four months following discharge from the hospital some interesting changes occurred. He became more self-confident, more mentally alert and energetic. He assumed a greater amount of poise and was much less shy. In general, his whole personality became brighter. Instead of shaving once a month, he shaved three times a week. His chest measurements increased 4 inches and his waist 1½ inches. He grew an inch taller and gained 10 pounds. In addition, he developed a slight acne of the face. I feel certain that much of these improvements must be attributed to better endocrine function of the testicles. Although sufficient time has not elapsed to make any definite statements concerning spermatogenesis, the analysis of the semen thus far has failed to show any spermatozoa.

Two months later the testicles were released and the scrotum was sutured on each side. At timt of this report, a month after the last surgical pro-

cedures, both testes are located in a midscrotal position and are freely movable. They are approximately one-half normal size. However, they are no smaller than when first encountered at operation. A testical which resides in the abdomen does not attain normal size. The scrotum has in this case developed considerably but remains less than the usual dimensions.

This patient illustrates that cases of intra-abdominal testes rarely undergo spontaneous descent. Surgical correction is indicated. Even at the age of 17 the physiologic and psychologic improvement resulting from surgery proved that the operation was warranted.

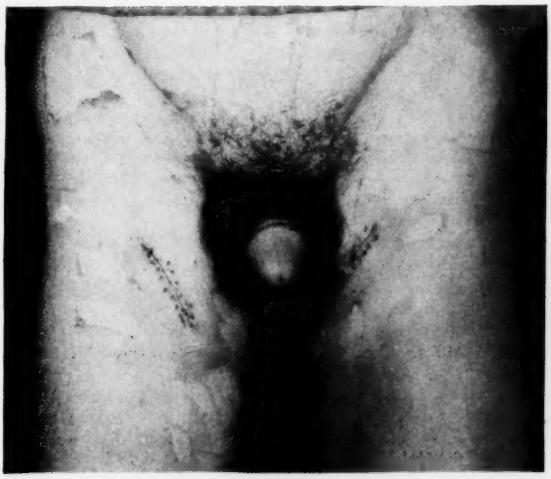

Fig. 3.—The end result.

Conclusions

1. The value of glandular therapy before the age of puberty is questionable.

2. Glandular therapy at the age of puberty is unnecessary.

3. By the sixteenth year the retained testicle will have descended spontaneously in 55 to 60 per cent of cases.

4. Cases of cryptorchidism associated with Froehlich's syndrome should have glandular therapy before puberty.

5. Glandular products have no harmful effect on the normally situated testicle. They have definite degenerative effect on the retained testicle.

6. Glandular therapy may produce harmful constitutional changes.

7. About 85 per cent success can be expected in surgical treatment.

8. The sixteenth year of age is the best time at which to operate.

9. The Keetley-Torek operation or a modification is the operative procedure of choice.

10. Cancer of the testes is 50 times commoner in the retained testicle.

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SULFANILAMIDE IN THE TREATMENT OF PERITONITIS

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THE application of sulfanilamide and other drugs of the sulfonamide group to the treatment of bacterial infections represents the culmination of many attempts to control diseases with chemicals since the dawn of bacteriologic research. Sulfanilamide was first synthesized in 1908 by Gelmo, a German organic chemist, but while this compound was used in the German dye industry in the form of azo compounds, its antibacterial properties were not investigated for more than a quarter of a century.

In the past history of therapeutics, certain drugs have risen suddenly into medical popularity only to reach a climax of acclaim and then pass into the realm of the forgotten. Other drugs have fluctuated between favor and disfavor, finally to assume a certain level of usefulness. Still others, belonging to a small group, have continued to bask in the light of therapeutic acceptance and have proved their value over a period of years. Long and painstaking effort, with a close cooperation between clinical and research facilities, is necessary for the proper evaluation of a therapeutic measure.

The synthesis of this group of drugs opened the way for extensive clinical and experimental observations, since their universal use was not shackled by patent rights. Only five years have elapsed since Colebrook and Kenny[1] published the first significant statistical evaluations of sulfonamide therapy in a single disease. Due credit must be given to Long and Bliss[2], who reported their findings to the Southern Medical Association in November, 1936, and who, besides discussing the therapeutic effects of the prontosils and sulfanilamide, voiced their opinion that the drugs acted directly on the micro-organisms, thereby producing bacteriostasis. The soundness of this statement has been demonstrated many times since, and has come to be the accepted opinion of most observers today.

Hundreds of derivatives of the parent compound have been synthesized. The three in most common use today are sulfanilamide, sulfapyridine and sulfathiazole. Of these three, in the treatment of peritonitis, sulfanilamide is the one advocated by most writers; sulfathiazole is next most popular and sulfapyridine least of all.

In this paper, I am dealing with secondary peritonitis, that which comes as a result of trauma or intraperitoneal disease. Mention should be made, however, of the work of Ladd, Botsford and

Read before the Nashville Surgical Society, Nov. 14, 1941.

Curnen[3] who, with the aid of sulfanilamide, have been able to reduce the mortality rate in infants and children in primary, idiopathic or metastatic peritonitis from 72 per cent to 28.5 per cent.

The ability to maintain the proper concentration of the drug in the peritoneal cavity is one of the main factors that determines the effectiveness of chemotherapy. By the intraperitoneal injection of normal saline one hour after administering sulfanilamide by hypodermoclysis to dogs, Ravdin, Rhoads and Lockwood report that a sample of the fluid aspirated half an hour later shows a concentration of sulfanilamide about one-half the blood level. Under such artificial conditions the fluid is leaving the cavity, while in peritonitis it is being poured into it. The conclusions of these authors were that the sulfanilamide concentration in the peritoneal cavity in peritonitis is about equal to the blood level.

From the best information that I can obtain, sulfanilamide is carried to serous cavities better than any of the other sulfonamide drugs. That is, a drug highly effective in the laboratory against most bacteria, but which is not effectively transported to serous cavities, will perhaps be of less therapeutic value in peritonitis than another drug having a lower bacteriostatic power but transported in higher concentration into the infected area. This applies to the use of the sulfonamide drugs either by mouth or parenterally.

Since the address of Dr. Ravdin before the Nashville Surgical Society last year, a number of us have been using sulfanilamide and sulfathiazole—powdered or crystalline—poured directly into the peritoneal cavity. This method of use has proved sound in every way, as far as I know. All authorities agree that the best results are obtained when three conditions exist; i. e., when the number of bacteria is small; when the amount of devitalized tissue is slight; and when the concentration of the drug is high. In placing the crystals directly around or in the infected region, the concentration in that area can be raised, temporarily, to an unbelievable degree.

One of the strongest arguments against the use of sulfanilamide intraperitoneally is that patients with diffuse peritonitis likely will exhibit some degree of liver dysfunction, and since most of the absorbed drug is thought to go through the portal circulation, one can conceivably add further insult to the liver by suddenly thrusting large quantities of sulfanilamide into the portal circulation.

Watson[5], of the University of Minnesota Hospital, says that a majority of patients receiving the usual dose of sulfanilamide prescribed in severe infections show some clinical or laboratory evidence of hepatic dysfunction. Bannick, Brown and Foster[6]; Cline[7] and Garvin[8] report cases of ascites, hepatomegalia, acute yellow

atrophy, and fatal jaundice in patients who have received sulfonamides. On the other hand, Long[9] says that previous jaundice or liver damage is not a contraindication, especially if the existing damage is a result of infection for which sulfanilamide therapy is indicated; and Cleveland[10], of the Mayo Clinic, reports that in a case of severe postoperative cholangitis, marked liver damage, and jaundice, sulfanilamide derivatives were given without any aggravation of liver damage.

Sulfathiazole is said to cause less liver damage, and should probably be used in cases of suspected hepatic dysfunction. Its use also has the advantages of possibly aborting postoperative pneumonia. In one of my cases, 9 Gm. of sulfanilamide was used intraperitoneally and the patient became jaundiced and disoriented. I feel that 4 Gm., and at the most 6 Gm., is probably the safest dosage. It is well to remember that the blood level will generally be raised the number of grams that are placed in the cavity. My case, when 9 Gm. was used, showed a blood concentration of 9 the next day.

In giving sulfanilamide by mouth or parenterally the schedule of 1 to 1½ grains per pound of body weight for the first 24 hours will usually give the desired concentration in the blood and tissues. Individual differences in absorption make it imperative that blood levels be run repeatedly. When it is being used parenterally, the subcutaneous route is preferable, using a 1 per cent solution and giving it every 8 hours so that the blood level can be maintained. The rectal administration has been advocated by some. I used this method in one case with good results.

Sulfathiazole has the added advantage that it can be used intravenously in the form of sodium sulfathiazole in concentrations up to 5 per cent. I have used it in two of my cases, and in one of these a high temperature was one of the complications. Aside from the fact that it, as well as sulfapyridine, can be used intravenously, there is doubt in my mind that either is preferable to sulfanilamide.

Everyone is familiar with the accepted symptoms of sulfonamide poisoning. It is not necessary to go further into that phase of the use of this drug than to say that it is an individual matter, based on the patient's ability to absorb and excrete the drug. I would like to report briefly my case in which I used the largest amount of the drug to date. The patient was a child of 5, with a ruptured appendix and spreading peritonitis. At operation 2 Gm. sulfanilamide was placed in the cavity; and from the time of her operation on September 16, until September 24, 10 Gm. was given by mouth and 10 Gm. by dermoclysis—a total of 22 Gm. in 8 days. On September 24, we changed to sulfathiazole, and 4 Gm. was given by vein,

5.5 Gm. by mouth, or 9.5 Gm. in 3 days. At that time, she developed intestinal obstruction and laparotomy was performed. Two grams of sulfanilamide was placed in the cavity, and from the time of her second operation on September 28 until October 2, 2 Gm. was given by mouth, 6 Gm. by dermoclysis, and 11.5 Gm. by rectal clysis—or 21.5 Gm. in eight days. Here, then, was a five year old child who had 43.5 Gm. of sulfanilamide in 16 days and 9.5 Gm. of sulfathiazole in 3 days. Her toxic symptoms were mild indeed, consisting of nausea, slight jaundice, and some red cells in her urine.

Peritonitis is of mixed bacterial type. Meleny has shown that the bacterial flora of peritonitis contains B. coli 87 per cent, hemolytic streptococci 7 per cent, non-hemolytic streptococci 21 per cent, green streptococci 49 per cent, and Welch bacilli 38 per cent—that the disease was more severe when more than one type of organism was present. Ravdin and Lockwood[4] stated that, while there is a well entrenched belief that sulfanilamide is effective only in infections due to certain cocci, "It is our impression that under special experimental or pathologic conditions which favor drug action, sulfanilamide has some degree of antibacterial action against almost all pathogenic bacteria." They go on to say that the gross pathologic character of the lesion is of more importance in determining the effectiveness of the drug than is the species of the infecting organism. In other words, infections characterized by a minimal degree of necrosis respond more favorably than do those associated with considerable tissue injury and necrosis, or when the infection is confined to an abscess.

I am unable to find an adequate explanation of the mode of action of the sulfonamides. Many theories and concepts have been advanced, none of which is either satisfactory or entirely clear to me. It is reasonable to assume, however, on the basis of laboratory and clinical evidence, that these drugs act in infections either by producing an environment in the body tissues and fluids which is unfavorable for bacterial multiplication, or that they act directly on the microorganisms themselves, producing bacteriostasis.

Bricker and Graham[11] demonstrated that sulfanilamide given to dogs in doses equivalent to that used in human therapy has an inhibitory effect on wound healing. They state, however, that by the seventh day there is little difference in the tensile strength of wounds treated by sulfanilamide and those not so treated. It has been my policy to place from .5 to 1 Gm. in the abdominal wound after the peritoneum is closed and after washing out the wound with saline. In the wounds that I have closed tightly, I have had no disruptions nor any frank infection—all have healed nicely with the exception of

two that developed a subcutaneous collection of serum; and I have been pleased to find that in some of my cases of drainage, the wound heals up snugly around the drains, and that in the others there is less sloughing of the fascia and subcutaneous tissue.

Report of Illustrative Cases

Case 1. Mr. C. V. H., aged 37, was admitted with a perforated peptic ulcer of 8 hours' duration. A satisfactory closure of the ulcer was obtained; the peritoneal cavity was aspirated and 4 Gm. of sulfanilamide placed in the peritoneal cavity. The wound was sutured without drainage. Convalescence was uneventful. The highest postoperative temperature was 100.4 degrees. The wound healed by first intention. The patient was discharged in 14 days.

Case 2. Miss E. H., aged 48, was admitted on account of carcinoma of the body of the uterus. Complete hysterectomy was performed. On opening the vault of the vagina, due to a faulty preparation, about 3 ounces of fluid came from the vagina into the pelvis. This was sponged out and 4 Gm. of sulfanilamide placed in the peritoneal cavity. Starting next day, sulfanilamide, .7 Gm., was given every 4 hours for three days. Blood concentration was 8. The wound healed by first intention. Convalescence was uneventful and the patient was discharged in 14 days.

Case 3. Mr. P. C., aged 72, was admitted with a ruptured gangrenous appendix and spreading peritonitis. Appendectomy was performed and drainage instituted: 9 Gm. of sulfanilamide was placed in the peritoneal cavity. The patient became disoriented and slightly jaundiced. Sulfathiazole, .7 Gm., was given every four hours for four days. At operation the temperature was 104 degrees, 24 hours later it had dropped to normal and remained so. Convalescence was far better than in the average drainage case. The wound healed up snugly around the drain.

Case 4. Mr. C. C., aged 42, was admitted to the hospital with a diagnosis of obstruction of the large intestine. There was a history of a previous cecostomy and a Mikulicz resection of the sigmoid for carcinoma 14 months previously. In attempting to do a cecostomy, due to adhesions from his previous operation the cecum was torn into and a direct contamination of the peritoneal cavity with liquid feces ensued. This was sponged out and 6 Gm. of sulfanilamide placed in the cavity. Sulfanilamide was given by dermoclysis for four days. The patient never developed peritonitis or abscess formation, and his highest temperature was 100.8. He was allowed to go home in 9 days.

Many authorities proclaim that a previous cecostomy is a protection against peritonitis. I do not believe, however, that the earlier operation could have afforded the protection that was shown in this case, and I feel that the intraperitoneal sulfanilamide prevented peritonitis.

Case 5. Mrs. L., aged 41, was admitted with a pelvic abscess. Sulfanilamide, 1 Gm., was given by mouth every 4 hours for 9 days. Her blood concentration was kept around 11. The abscess increased in size in spite of the drug, and drainage was instituted. After drainage, her temperature came to normal and remained so until her discharge. This bears out the statement that the majority of abscesses will not clear up with the use of sulfanilamide unless the abscess itself is drained.

CASE 6. M. S., a white girl, aged 8, was admitted to Vanderbilt Hospital with a ruptured appendix and spreading peritonitis. No drug was placed in the cavity, but sulfathiazole was given by mouth and intravenously. Her convalescence was fairly comfortable, but her temperature and white count increased daily until the temperature reached 104 degrees on the ninth day and the white count 41,000. Sulfathiazole was discontinued and 24 hours after the discontinuance of this drug, her temperature came to normal and remained so and her white count dropped to 12,000. This case is illustrative of the fact that sometimes the sulfonamide group will cause an increase in temperature and white count.

CONCLUSIONS

1. Sulfanilamide, although it will not take the place of any indicated surgical measure, is a valuable aid in the treatment of peritonitis. Its implantation directly into the abdominal cavity is moreover an excellent prophylactic measure. Other drugs of the sulfonamide group have also been used but I have had no experience with them in cases of peritonitis.

2. The tissues of the abdominal wall, it appears to me, have a tendency to heal more rapidly when sulfanilamide is used.

3. A new era in chemotherapy is well under way; we are in a position to watch its development and perhaps aid in its perfection.

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FRACTURES OF THE BONES IN THE HAND AND THE FOOT

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ONLY those affiliated with industries or interested in industrial injuries, see fractures in the hand and the foot in any appreciable amount, as they are always out scouting for them.

It is indeed surprising to find fractures in these regions where so little visible external trauma presents itself upon examination shortly following an injury, such as, swelling, discoloration or skin abrasion. Severe pain upon manipulation or exaggeration of the slight pain that may be present due to the injury, is the outstanding signal for a possible fracture. Even this red light may be absent. Pain in some injuries, even where a fracture is thought to be non-existent, will prevent manipulation in an attempt to bring out crepitation if a fracture be present.

Fractures in the locations cited are often present following the slightest of injuries, especially the subperiosteal ones. The external appearance should never influence one's judgment in dealing with what is hidden and an x-ray examination should be one of the deciding factors in forming conclusions. Three views should always be taken: an anteroposterior, lateral and oblique. If negative, and pain does not subside within eight to twelve days after some type of immobilization, re-raying should be done.

In a recent article by Hammond and O'Connor[1], reporting on occult fractures, they state that when the roentgen ray examination is negative, and in case of doubt, the clinical examination should prevail, and that these occult fractures, as they wish to call them, will show up on further roentgen ray examination after reparative changes take place.

Seven recent cases are herein presented; five fracture cases and two non-fracture cases. The latter were treated as fractures until proven otherwise.

REPORT OF CASES

CASE 1:—On Aug. 22, 1939, Mr. W. G. H., aged 43, while cleaning off the top of a naphtha tank, slipped from its top and fell a distance of 12 feet, landing on his right heel. The surface which he struck was a hard surfaced one.

He was seen about one-half hour following his accident. He stated that he could not place his right heel to the ground without severe pain and that he felt a grating sensation. Upon examination there was no swelling, discoloration or skin abrasion, but there was very severe pain when manipulation was attempted, also a marked crepitation could be felt. An x-ray was made at once and showed the following:

"Comminuted compression fracture of the waist of the right os calcis with some flattening of the longitudinal arch."

The fracture was reduced by the closed method under the fluoroscope. The foot was brought into full dorsal extension in order to relax the heel tendon and pressure was applied under the arch. A plaster cast was applied over stockinet and the plaster was well molded under the longitudinal and transverse arches. The cast extended up to the upper third of the lower leg. Six

Fig. 1. Lateral view: Comminuted compression fracture of the right os calcis. (Case 1).

days later a rocker iron was placed on the cast, running from the toes to the heel and he was allowed to walk about with the aid of crutches. The cast was removed Dec. 19, 110 days following injury, but he was not allowed any weight bearing. On Jan. 7, 1940, he was allowed to begin to put some light weight on the heel.

On Feb. 4, 1940, a high top shoe, with an arch support, was placed on the foot. A piece of sponge rubber was placed in the heel, which acted as a cushion and he now was allowed full weight bearing. This piece of rubber was gradually diminished in thickness. On Feb. 22, 1940, six months following the injury, he returned to work and has been working steadily since. The important point in heel fractures is not to allow early weight bearing on the heel as mushrooming will take place.

A recent examination reveals full function, no pain or discomfort, and he carries on his work as a painter as well as he did previous to his injury. The arch support has been discontinued.

CASE 2.—Mr. G. P. M., aged 48, was injured Jan. 24, 1940. While changing clamps on a boring mill machine one of the clamps slipped from his hands and fell on the dorsal surface of his left foot. The distance of the falling object was about three feet.

He was examined very shortly following his accident. There was a slight skin abrasion over the dorsal surface of the left foot, to the inner and lower side. There was no swelling or discoloration, but there was slight pain over the dorsal surface of the foot corresponding to a point just proximal to the

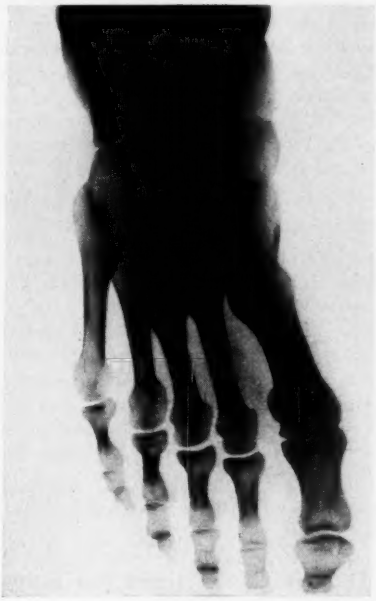


Fig. 2. Anteroposterior view: Subperiosteal fracture of the right third metatarsal at its proximal extremity. (Case 3).

metatarsophalangeal joint of the great toe. On manipulation this pain was exaggerated but no crepitation could be felt. An x-ray was taken and the following was brought out:

"Oblique fracture of the distal end of the proximal phalanx of the left great toe on its tibial border with no displacement of fragments."

The foot was prepared and a piece of adhesive tape, ¾ inch in width, was brought from the plantar surface of the foot over its long axis, extending along the under surface of the left great toe, then over its dorsal surface, continuing over the dorsal surface of the foot. This piece of tape was in one piece. He was made to place his weight on the foot while standing on a foot stool with the toes slightly extended over its edge, with the great toe slightly in dorsal flexion. The tape was anchored while the foot was in this position. To secure the tape further, a strip of tape 2 inches in width was brought circularly around the dorsal and plantar surface of the foot. Two pieces of tape ½ inch in width were brought circularly around the toe, one around the proximal and the other around the distal phalanges.

The latter two pieces of tape prevented the tape that ran over the long axis of the toe from buckling. On February 10, the tape was taken off and re-applied and on March 4, six weeks following his injury, it was removed. During this time crutches were used and no time was lost from his work.

On recent examination he has full function and is free of all pain.

CASE 3.—Mr. D. S., aged 45, was injured June 30, 1941. While working as a hooker on a traveling crane, a bundle of steel in sheets, that was banded together, slipped and struck the dorsal surface of his right foot. He was wearing high top shoes at the time of the accident. He was seen shortly following his injury and there was no swelling, discoloration or skin abrasion over the dorsal surface of his foot. He had slight pain, which upon manipulation of the foot was more painful, and corresponded to a point over the third metatarsal bone. No crepitation could be brought out. Upon standing and putting weight on the foot the pain was most acute. The foot was rayed for a possible fracture and disclosed the following:

"Subperiosteal fracture of the proximal end of the right third metatarsal with no gross displacement of fragments."

A plaster cast was applied over stockinet with the foot placed in a neutral position midway between dorsal flexion and extension. The cast was brought out beyond the toes on the plantar surface and over the dorsal surface to the distal phalangeal joints. The cast was well molded under the transverse and longitudinal arches and extended upward to the upper third of the lower leg. The immobilization was for twenty-six days and for the following ten days he was allowed light weight bearing. During this period he used crutches and at the termination of the ten day period his crutches were discarded and full weight bearing was permitted. No time was lost from his employment as he was given work that he could do.

A recent examination showed no impairment and he carries on his work as well as previous to his accident.

CASE 4.—Mr. R. D., aged 39, was injured June 6, 1941. While carrying an armful of bricks, he slipped and in falling, struck the back of his left hand against the concrete steps leading up to one of the buildings.

He was seen about fifteen minutes following his injury. There was only a slight skin abrasion over the knuckle (left fifth metacarpophalangeal joint). The pain was most acute and crepitation could be elicited over the point of injury. The small finger was rotated somewhat under the flexor surface of the ring finger. There was slight swelling but no discoloration. An x-ray was taken and the following presented itself:

"1. Oblique fracture of the distal end of the left fifth metacarpal with slight lateral displacement of the distal fragment.

"2. Incomplete oblique subperiosteal fracture of the distal end of the left fourth metacarpal."

The fracture of the left fifth metacarpal was reduced and the hand was placed over a metal metacarpal splint (a four inch roller bandage can be used just as well). All of the fingers were drawn down over the splint in as full flexion as possible and held in place by zinc oxide adhesive tape, a separate strip being used for each finger. This type of splint with the tape will prevent displacement of fragments. The tape must start about 3 inches proximal to

the knuckle (metacarpophalangeal joint). On June 20 (two weeks later) the index and middle fingers were released. The splint was removed July 1, and the hand was carried in a sling for two weeks. Full function was obtained by July 21, six weeks following his injury. No time was lost from his work as he was given work that he could do with one hand. His last examination shows no disability and he carries on his tasks as well as previous to his injury.

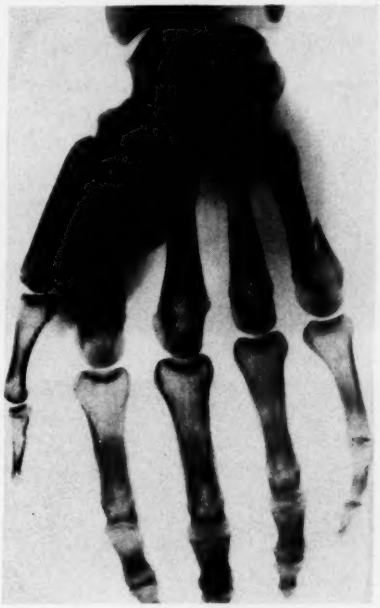


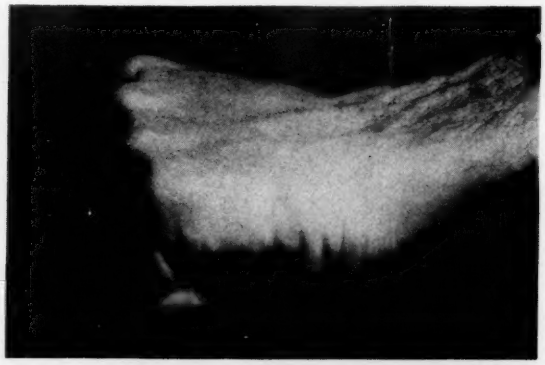
Fig. 3. Anteroposterior view: Oblique fracture of the distal end of the left fifth metacarpal and incomplete oblique subperiosteal fracture of the distal end of the fourth metacarpal (Case 4).

CASE 5.—Mr. O. C., aged 50 years, injured July 24, 1941. While changing a buffing wheel on a machine, the machine was started up accidentally. The pad that he was wearing at the time on his left hand was caught and his forearm was twisted and at the same time he struck the back portion of his hand against the machine.

He was seen shortly after the accident and there was only slight swelling, no discoloration or skin abrasion over the back portion of the hand. He had some pain over the anterior (flexor) surface of his left forearm, especially at the wrist. The pain became exaggerated on attempting pronation or supination but was more marked on pronation. On having him flex his fingers into the palm, he complained of rather severe pain over the flexor surface at the wrist. No crepitation could be brought out. An x-ray was taken and the following was disclosed:

"Dislocation of the semilunar anteriorly—flexor surface—and an incomplete subperiosteal fracture of the proximal end of the fifth metacarpal with no displacement of fragments."

The hand and forearm were prepared and the dislocation was reduced by traction and manipulation. The traction was very gradual, steady and constant and extended over a period of 15 to 20 minutes before reduction was attempted. He was placed upon a table on his back. The forearm was flexed on the upper arm at a right angle and the upper arm was fixed to an upright



Figs. 4 and 5. Show all fingers fully flexed into the palm and all fingers fully extended and separated (Case 4).

on the table. A Buck extension was applied to all the fingers with the exception of the ring finger which had its corresponding metacarpal bone fractured but the fragments were not displaced. The individual Buck's were made of adhesive tape. They were tied to a lead about 3 feet in length and midway between the lead was a turn buckle with a 3 inch travel at each end, giving a 6 inch travel in all. The distal end of the lead was fastened to an

upright at the lower end of the table. The turn buckle was turned very slowly. The clock was watched and a turn was made in the buckle every two or three minutes until 15 or 20 minutes had passed. By this time full traction was secured. This allowed the os magnum, which had moved upward following the semilunar dislocation, to be pulled down.

The joint space between the os magnum and semilunar was widely separated. The thumb of the operator's hand was pressed upward against the dislocation while the other hand was placed over the dorsal surface of the patient's wrist making counter pressure. This manipulation reduced the dislocation. The traction was released and a plaster cast was applied next to the skin with the hand slightly dorsally flexed. The cast extended practically up the entire forearm and down to the knuckles on the dorsal surface. On the palmar surface the cast extended just proximal to the transverse furrow or crease of the palm. The thumb portion was cut away to allow full play at the metacarpophalangeal joint.

On September 9, seven weeks after the injury, the cast was removed and the arm carried in a sling. On September 16, he was allowed to return to work, which was light in nature. The last examination showed that he has full function and is free of all pain. He carries on his original work as well as previously.

CASE 6.—Mr. F. Z., aged 38, was injured June 6, 1941. While handling an electric drill, it slipped from his hands and fell upon the dorsal surface of his right foot.

He was seen shortly following his injury and upon examination there was no swelling, discoloration or skin abrasion, but he complained of rather a sharp pain about the central portion of the dorsal surface of his foot. This point corresponded to the third metatarsal. Upon applying pressure over the dorsal surface the pain was much exaggerated and upon having him stand and put full weight on the foot he said it was rather severe. An x-ray was reported negative.

The foot was immobilized and he was put on crutches. He still complained of pain but it seemed not to be as severe. On June 18, twelve days after the injury, the foot was re-rayed and was again negative. Immobilization was removed. A high fitting shoe was used, and he was discharged from treatment. At the last examination he had full function and was free of all pain and doing his regular work.

CASE 7.—Mr. C. J. S., aged 45, was injured July 9, 1941. While assisting in loading a bundle of sheet steel on a hand truck, the bundle slipped and fell on the dorsal surface of his left foot.

He was seen about one hour following his injury. There was very slight swelling, no discoloration or skin abrasion. He complained of severe pain over the dorsal surface of his left foot at about its center. On manipulation the pain was acute but no crepitation could be brought out. The pain was most exquisite when putting his full weight upon the foot. An x-ray was taken at once and the findings were negative.

The foot was placed in a plaster cast in a neutral position and treated as a possible fracture of one of the metatarsal bones, probably subperiosteal, and the patient was put on crutches. He complained of continuous pain over the dorsal surface and a possible formation of a deep seated abscess was consid-

ered. His temperature was normal and there was no swelling of the toes, nor did he complain of any pulsation or throbbing. Twelve days following the injury the foot was re-rayed but the plates again were negative. On July 25, the cast was removed and he continued on crutches as he complained of some slight pain when putting his foot to the ground. August 12, six weeks following his accident, his crutches were discarded and he was discharged from further treatment.

His last examination shows him to be free of all pain and has full function. At the present he carries on his work as well as previously.

Summary and Conclusions

All injuries to the hand and the foot should be x-rayed. If negative for a fracture and there is still doubt of a fracture being present, the part should be immobilized. To clear up any continued doubt, they should be re-rayed in from eight to twelve days.

207 Ross Avenue

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INTESTINAL STENOSIS IN INFANTS

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FROM pyloric obstruction to anal atresia there is a wide anatomic and etiologic range for the occurrence of intestinal obstruction in infants. In addition to these two causes it may result from Meckel's diverticulum, intussusception, malrotation of the intestines, foreign bodies, volvulus, extrinsic tumors causing pressure, adynamic or mechanical ileus, and others including congenital atresia or stenosis.

Many of these lesions are frequent enough to be rather commonplace and it is with some apologies that they are discussed even in the different diagnosis btween them and congenital atresia or stenosis which will be presented somewhat in detail and illustrated by a case report of the latter condition.

Since the terms congenital atresia and congenital stenosis of the intestine are sometimes incorrectly used interchangeably it might be well to eliminate this confusion by defining what is meant by each. In congenital atresia, which is more rare, there is no patent continuity between the proximal and distal loops of intestine. This interruption may be due to the presence of a membranous diaphragm, replacement of a segment of intestine by a fibrous cord, or more rarely by the termination of the proximal segment in a free blind pouch. The lesion may be multiple and distributed anywhere in the small intestine. Congenital stenosis, on the other hand, presents a variable degree of obstruction which, however, is never complete. The narrowing of the lumen may vary from only slight dimunition to such a degree of contraction that a probe can be barely introduced—but there is a definite patency to the lumen. The region of the duodenum is the favorite site and the lesion is usually single.

Since both lesions are present at birth the cause must be one operative in fetal life. Many factors have been suggested but not uniformly accepted. It would seem that atresia is probably best explained by the fact that between the thirtieth and sixtieth day of fetal life the previously patent intestine becomes a solid organ and then opens again. Failure of this normal reopening to occur would obviously result in an atresia. If this reopening did occur but not proceed to completion stenosis with inadequate patency could result from the heaping up of mucosa or submucosa or from fibrosis of the intestinal wall. A similar type of fibrosis could be caused

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by angulation from adhesions due to fetal bands. Some authorities admit this latter view which would permit the acceptance of the case to be reported as one of congenital intestinal stenosis. Those cases with adhesions not from fetal bands but from fetal peritonitis should probably be classified, technically, as cases of mechanical or dynamic obstruction rather than congenital stenosis.

Generally speaking the symptoms and signs in atresia and stenosis are essentially the same, the difference being quantitative rather than qualitative and depending upon the degree of obstruction. The first symptom will be vomiting and it will occur on the first day if there is atresia and within the first week if there is only stenosis. The vomitus will almost invariably contain bile since in practically every instance the atresia or stenosis will be below the level of the ampulla of Vater. Distention, general or limited to the epigastrium depending upon the level of the obstruction, is the next symptom to appear. This distention of the delicate proximal bowel leads to ischemia, necrosis, and perforation of the involved segment and with dehydration constitutes the serious danger of either atresia or stenosis. While the distal segment is disproportionately small there is no palpable mass at the junction of the dilated and collapsed segments. Although the number and volume of the stools is decreased in stenosis they do occur even if atresia exists, because of the meconium present.

In differentiating these lesions from other causes of obstruction congenital pyloric obstruction should probably be considered first. The symptoms in this latter lesion appear later, the vomitus does not contain bile, peristaltic waves are generally quite evident, a palpable mass can usually be demonstrated and x-ray examination should distinguish between the levels of the sites involved. Because of the friability of the proximal segment in atresia or stenosis it has been suggested that a preliminary flat plate be made since it alone may establish the diagnosis. If barium is used it should be thin in consistency and small in amount.

The usual type of intussusception in the ileocecal region with cramps, frequent bloody stools and a crescent-shaped filling defect after a barium enema is not likely to be confused with stenosis or atresia or even to occur at this age. Intussusception involving the duodenum or proximal jejunum would probably be impossible to differentiate.

High mechanical obstruction from inflammatory adhesions would also be impossible to distinguish clinically from stenosis or atresia but the distinction would be unnecessary because each would give symptoms demanding exploration. The same is probably true of

the other possible causes of obstruction in infants with the exception of extrinsic tumors and atresia of the anus where the physical signs should usually be obvious.

The differentiation between atresia and stenosis rests upon three factors—the intensity and time of appearance of the symptoms, as previously mentioned, the complete or partial blockage of barium as shown by x-ray examination, and the results of the Farber test. This rather ingenious test is based upon the fact that one of the normal constituents of meconium is the vernix caseosa, squamous epithelial cells desquamated from the skin of the fetus and swallowed with the amniotic fluid in intrauterine life. The finding of such cornified epithelial cells in a representative part of the stool which has been properly fixed and stained is rather satisfactory evidence that the obstruction is only partial. Conversely, the absence of such cells would indicate a complete obstruction. This test, of course, if of value only during the first few days after birth.

While some cases of low grade stenosis may be compatible with life for many days, all cases of atresia and all cases of stenosis showing early and marked symptoms will require prompt surgical intervention. A rather high operative mortality must be accepted but in that type of case any method with less than 100 per cent mortality will offer better results than non-surgical treatment.

At laparotomy one of two procedures will be indicated. If one is fortunate enough to find a stenosis due to fetal bands which can be freed without destructive injury to the mesentery or the bowel itself nothing more will be required. In instances where this cannot be done safely and in all cases of atresia a lateral anastamosis, usually duodenojejunostomy or rarely gastrojejunostomy must be done. Intraluminal dilatation is not practical because the proximal loop is too friable and the distal loop too small. Resection is reported as uniformly fatal and enterostomy as incompatible with life.

While open anastomosis carries little danger of peritonitis because of the absence of virulent organisms at that time it would seem to be technically difficult because of the disproportionate size of the segments. Dilatation of the smaller segment with mineral oil or air and the placing, temporarily, of a small catheter in that segment during part of the suturing have been suggested as helpful aids.

Probably the best closure of the abdominal wound is with through-and-through retention sutures. Intravenous fluids and transfusions will be indicated for relief of the dehydration and vitamin K and transfusions to counteract any bleeding tendency. Early resumption of feeding will be permissible.

Report of Case

M. P. M., female, was readmitted to St. Joseph Infirmary on the nineteenth day after birth. At delivery low forceps had been used and the baby appeared to be entirely normal. Her birth weight was 7 pounds, 2½ ounces. While in the hospital the baby vomited only several times. However, she did not receive nourishment regularly and then only one ounce at a time because of a severe thrush infection. On discharge from the hospital she weighed only 6 pounds. After she was taken home she began to vomit two or three times a day, became lethargic and dehydrated and when readmitted appeared to be desperately ill, had a subnormal temperature and weighed only 5 pounds 6 ounces. The vomiting continued but she had several stools; she showed epigastric distention and apparently she was in pain. No mass was palpable.

A blood count showed 4,440,000 red blood corpuscles and a hemoglobin of 98 per cent probably indicating the dehydration present. The white count was 16,600 with 52 per cent neutrophils. She was transfused. X-ray examination was made and reported as follows:

"Esophagus negative. Stomach is normal in size, shape, and position. The pylorus and duodenum filled immediately. The barium, however, was arrested at the duodenojejunal flexure beyond which none passed up to 24 hours. There is a small amount of gas in the intestinal canal beyond the duodenum but no barium. There is apparently an abnormality at the duodenojejunal flexure producing practically complete obstruction. At the end of 48 hours there is still a considerable amount of barium in the stomach. A small amount has reached the intestine and the head of the meal is in the transverse colon."

The Farber test was not done because of the duration of the disease, the fact that some food had been retained and the meconium passed.

Six days after readmission laparotomy was done under ethyl chloride and ether anesthesia. The incision was made above and to the right of the umbilicus. Exploration showed several loops of the first portion of the jejunem to be securely bound to the ligament of Treitz by adhesions between it and the mesentery of that part of the jejunem. These adhesions were firm and fibrotic. The duodenum was distended and jejunum was quite small. The pylorus was negative to inspection and palpation. The adhesions were freed with some difficulty and the involved mesentery was found to be friable and the bowel itself definitely dark in color. Hot packs brought about some improvement in appearance and the abdominal wound was then closed in layers with plain and chromic catgut and dermal for the skin. No drain used.

On the following day the temperature reached 102.4, her bowels moved, the vomiting decreased and there was less distention. The transfusion was repeated and there was general improvement. On the fifth postoperative day there was profuse sero-sanguinous drainage and on the next day definite bleeding from the entire suture line. This rapidly subsided after another transfusion and the administration of vitamin K. There was some separation of the skin edges but the fascia and peritoneum apparently remained intact. When the child was discharged from the hospital on the fifteenth postoperative day she weighed 6 pounds 8½ ounces (a gain of more than a pound), her abdomen was soft, her formula had been increased in amount, she regurgitated not more than once a day and then only part of a feeding, her stools were practically normal, she was mentally alert, and her abdominal wound showed healthy granulations. This progress has been maintained at the home for several weeks.

In conclusion it might be suggested that the subject of intestinal obstruction in infants is an important one worthy of most serious consideration. More etiologic factors have to be borne in mind in infants than in adults. While the incidence of those causes usually seen in adults is admittedly less frequent in infants, they do occur and must be considered along with those causes necessarily or practically limited to very early life. The dependence upon a second hand history complicates the diagnosis, the declining nutrition demands early intervention, and the poor resistance to shock necessitates delicate and minimal operative trauma. While improvements in the latter regard are constantly appearing there is an impassable barrier beyond which surgery cannot tread. Appreciable reduction in mortality must in a large measure be dependent upon earlier diagnosis.

516 Brown Bldg.

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INDICATIONS FOR SURGERY IN DISEASES OF THE THYROID

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AS Dupuytren would tell his students over one hundred years ago, "Diagnosis holds the first rank in our science and is the most difficult part of it; without an exact and precise diagnosis theory is always faulty and practice often incorrect."

In no field of medicine is a correct diagnosis more important than in disturbances of the thyroid. To facilitate making a diagnosis one should have a classification and for years we have followed the one devised by Plummer of Rochester. Some pathologists object to this classification and we recognize that it is not perfect but for daily use at the bedside and in the office we have found it to be more satisfactory than any other. No classification, however, will be found completely satisfactory until the etiology of the various diseased conditions is known. Plummer recognized nine major conditions as follows:

1.—Diffuse colloid goiter.
2.—Adenomatous goiter without hyperthyroidism.
3.—Adenomatous goiter with hyperthyroidism.
4.—Exophthalmic goiter.
5.—Thyroiditis.
6.—Myxedema.
7.—Cretinism.
8.—Malignant diseases.
9.—Congenital abnormalities.

DIFFUSE COLLOID GOITER

Diffuse colloid goiter is sometimes called simple goiter, endemic goiter, iodine-want goiter, adolescent goiter, or non-toxic goiter. None of these terms is ideal because not one expresses the whole story and can not until the cause of the condition is known. The distinguishing features are that it is a soft uniform enlargement of the thyroid gland, causing no symptoms, more frequent in females than males, and usually appears at the time of puberty. Here as elsewhere the difficulty is in making a diagnosis. With colloid goiter the pulse rate is normal and the basal metabolic rate is normal or below. When there is an associated neurasthenia, diagnosis is particularly difficult. The great majority of colloid goiters should have medical treatment only. A few, however, will need surgical treatment. Some will become nodular and should be removed as all nodular goiters are potentially dangerous. Others because of their size will be unsightly and have a bad psychologic

effect upon the possessor and should be removed. Rarely colloid goiters will cause pressure and require removal.

As stated previously the great majority of colloid or simple goiters do not need surgical treatment. They are, as far as we know, due to a lack of iodine at some time in the individual's life. They are harmless and in most cases do not lead to any serious sequelae. A difficult situation often confronts the surgical consultant, however, in that the individual has been told by some other physician that their goiter, when it is of the simple colloid type, should be removed. Such situations require the utmost clinical judgment and diplomacy. I think the essential point for the patient and her family is to understand fully what surgical treatment has to offer in colloid goiter and what are the potentialities for harm. They should be told that the great majority of them are harmless and then if for psychologic or cosmetic reasons the operation is desired and after full consultation with the family physician, operative removal is justified. The family and patient must understand, however, that removal of a colloid goiter will not cure neurasthenia or turn a backward, introspective, nervous individual into an aggressive, dominant, properly stabilized person.

Adenomatous Goiter Without Hyperthyroidism

Adenomatous goiter without hyperthyroidism is usually a surgical condition. Nodular goiter is a better term than adenomatous as many of the nodules which occur in diseased thyroids are not true adenomas but can not be distinguished from them clinically. I use the term adenomatous because Plummer has used it and because in spite of its imperfections it is still the best classification for clinicians to follow.

Nodular goiter may be defined as any localized and circumscribed enlargement of the thyroid gland. Time does not permit a discussion of their etiology or pathology. They may be single or multiple, small or large, and sometimes may attain huge size. They usually first make their appearance in early adult life but may occasionally first be seen at any age even at birth. They may become substernal, descend into the thorax, and in advanced cases, even rest upon the diaphragm. They may remain stationary in size for many years and then begin to grow or may grow steadily from the beginning. They may cause pressure upon the trachea, esophagus, mediastinal veins, or recurrent laryngeal nerve. Most important of all they may become toxic or malignant and most of them tend to do one or the other if permitted to remain.

The only treatment for adenomatous goiter is surgical removal. Sometimes a patient will refuse operation when the adenoma is giving no symptoms and is not particularly unsightly. In such cases, the patient must be told of the dangers of toxicity and of malignancy and should be advised to submit to a careful examination every three months. The treacherous factor of these growths is that they may give rise to distant metastases without any change in the primary growth.

In the uncomplicated cases surgical excision of thyroid adenomas carries very little risk and is one of the most satisfactory operations of surgery. In removing them both lobes of the thyroid should be exposed widely and all diseased tissue removed. Most recurrences are due to inadequate removal of diseased tissue at the time of the primary operation.

Since postoperative myxedema or myxedema of any kind is much more serious in very young people and since the entire gland is often involved in the adenomatous process, it is sometimes wise to postpone operation until the individual is 25 years old. When there are pressure symptoms, however, and when the adenomas are growing, removal at the younger age must be undertaken.

Adenomatous Goiter With Hyperthyroidism

When the adenomatous goiter has become toxic as evidenced by an increased pulse rate while resting, nervousness, easy fatigue, muscular weakness, increased tolerance for cold, tremor, an increased pulse pressure, moist skin, and elevated basal metabolic rate, then early removal is indicated more urgently than ever. In determining basal metabolic rates and pulse rates the examiner must be certain the conditions are truly basal and rates should be determined upon three or more consecutive days to eliminate the element of nervousness. The great danger of toxic goiter is the damage it does to the circulatory system and often the symptoms which bring the patient to the physician are circulatory in nature such as dyspnea and edema.

Exophthalmic Goiter

Exophthalmic goiter is also known as Graves' disease, Basedow's disease, primary hyperthyroidism, diffuse toxic goiter and diffuse hyperplastic hyperthyroidism. If one accepts the classification of Plummer, exophthalmic goiter is a distinct disease with certain characteristics which separate it from other toxic goiters. These characteristics are ocular symptoms, emotional instability, useless, purposeless movements, a pronounced iodine response and gastro-

intestinal crises. Primary hyperthyroidism occurs in both sexes but more frequently in women. It may occur at any age and is not uncommon in children. It is more frequent in the so-called goitrous than the non-goitrous regions but does not have the marked geographic distribution that is true of the nodular type. The cause of it is unknown but it so frequently follows emotional strain, prolonged fatigue, or upper respiratory infections which are somewhat prolonged that there must be some etiologic bearing other than coincidence. Warthin stated that it occurs in a definite type of individual which he described at length. Usually the gland is moderately, firmly, and symmetrically enlarged. There have been cases in which the gland is even smaller than normal. The texture is between that of the soft colloid goiter and the stony-hard malignant goiter. The symptoms which are usually more pronounced are those of the toxic nodular goiter plus the characteristic features just enumerated. Untreated, most cases terminate in death though a few will burn themselves out, so to speak, leaving the individual myxedematous. Remissions are common even in severe cases. The response to iodine is of special interest. The giving of iodine to individuals with primary hyperthyroidism results in a marked temporary alleviation of symptoms including a drop in basal metabolic rate. The maximum response is usually obtained in ten days and in doubtful cases this response is of value diagnostically. Also the blood cholesterol is decreased.

The treatment of primary hyperthyroidism is subtotal thyroidectomy. By subtotal thyroidectomy is meant the removal of all but a very small portion of the thyroid gland. Just how much to leave behind has been a controversial problem for years. I believe the present tendency is to leave less and less remaining tissue as it decreases the likelihood of recurrence and any resulting hypothyroidism can now be easily treated with the standardized extracts of thyroid at present available. The operation should not be undertaken without proper and adequate preoperative treatment. I have found a good time to operate is when the patient begins to put on weight. A few cases who have had a prolonged or severe illness can not be gotten in condition for the subtotal operation. These should have first ligation of the superior thyroid arteries and then a lobectomy upon one side and later an excision of the remaining lobe. Plummer's introduction of iodine as part of the preoperative treatment has decreased the necessity for stage operations and lowered the mortality of both the subtotal and stage operations. There are few if any contraindications to the operations just listed and only rarely will one encounter a patient so ill she will die in crisis before she can be gotten in condition for the ligation. It

should be emphasized repeatedly, however, that the subtotal operation should not be performed unless the patient is in condition for it. By using stage operations for the seriously ill, many patients will be restored to health which otherwise would succumb. Sometimes irradiation is useful in preparing a patient for operation.

Except as a means of preparing a patient for operation, the medical treatment of exophthalmic goiter has not been satisfactory. Some cases have been apparently cured by treatment with the roentgen ray and radium but radiation therapy has not proved a satisfactory routine form of treatment. Means, in Musser's textbook of "Internal Medicine," has outlined the principles of treatment of exophthalmic goiter. He wrote:

> Roentgenray and radium, though effective in some cases, are on the whole slower and less certain in their effect. In many instances these forms of treatment make patients better but do not make them well, resembling in this respect the less radical resections that were done in pre-iodine days. The time to operate is as soon after the diagnosis is made as full iodinization is obtained, except with such patients who, on the continued use of iodine, are getting worse. With these a delay until a period of spontaneous improvement sets in is desirable.
>
> Contraindications to operative treatment are practically non-existent. Cardiac insufficiency is added indication for operative treatment; so is a complicating diabetes mellitus. Acute infections, especially respiratory, may necessitate a brief postponement. Chronic tonsillar or sinus infection, we have found, is better treated radically after the goiter is out than before.

Thyroiditis

Thyroiditis may be subdivided into the acute and chronic. The chronic may again be subdivided into the non-specific, the tuberculous, the syphilitic, and the actinomycotic.

Acute thyroiditis is usually obvious with pain, swelling, tenderness, heat in the thyroid itself with fever, polynuclear leukocytosis, dysphagia, and frequently chills. There may or may not be a preceding goiter. Treatment is medical with usually complete resolution of the process. Occasionally suppuration with fluctuation ensues and incision and drainage becomes necessary. When present, suppuration must be detected early and incision performed at once to prevent rupture into the mediastinum. Aspiration is sometimes of value in reaching a diagnosis.

Chronic thyroiditis is a rare disease and is not an end result of the acute since the acute cases resolve leaving no permanent damage.

Tuberculous, syphilitic, and actinomycotic thyroiditis are extremely rare diseases. There are many cases of tuberculosis of the thyroid reported in the literature which will not withstand a careful

analysis. The finding of giant cells in the sections studied microscopically does not warrant a diagnosis of tuberculosis. The tubercle bacilli must be found in the gland before the diagnosis of tuberculosis is justified. When found, they are usually part of a generalized miliary process.

Chronic thyroiditis is a low-grade process from the beginning and as stated is not an end-result of acute thyroiditis. There are two distinct types, the fibrous (Riedel) and the lymphoid (Hashimoto) and the cause of both is unknown.

Of the two types there are many features in common such as gradual enlargement, pressure symptoms (dyspnea and dysphagia), adherence to surrounding structures, and reduced function. The fibrous type may be stony hard while in the lymphoid there may be tenderness and pain with fever and leukocytosis. The reduced function and the absence of extension to the regional lymph nodes help distinguish thyroiditis from malignancy.

The treatment is surgical removal which though difficult technically because of adhesion to surrounding structures gives excellent results. Hypothyroidism usually follows operation. The lymphoid type may respond to x-ray. The objection to x-ray therapy is that without microscopic examination one can never be quite sure whether malignancy is present or not.

Myxedema and Cretinism

Treatment by surgery is never needed for myxedema or cretinism.

Malignant Diseases

Cancer of the thyroid is not a rare disease and is nearly always a positive indication for operation. Sarcoma of the thyroid is extremely rare but the principles of treating it are the same as those for cancer. Complete surgical removal offers the only hope for cure. X-ray treatment following thyroidectomy is a helpful adjunct but except as a palliative measure in far advanced cases should not be used alone. Malignant tumors of the thyroid vary greatly in their response to radiation so it should be used in practically all cases following operation. Means states that the "squamous cell carcinomata are totally resistant to x-ray."

The most important single feature concerning cancer of the thyroid is that over 90 per cent of such cancers arise in previously benign adenomas. Here then is an ideal opportunity for the prevention of cancer by the early removal of adenomas of the thyroid. Lateral aberrant thyroids are likewise prone to become malignant and should be removed whenever found.

There are no definite criteria for diagnosing cancer preoperatively. Only in far advanced cases where there is fixation, stony hardness, and extension to the cervical nodes will a preoperative diagnosis be possible. What makes the early cases particularly difficult is that many innocent looking adenomas have already given rise to distant metastasis and some of the stony hard glands are thyroiditis and not cancer. As would be suspected, malignant glands often cause pressure symptoms.

Since malignancy of the thyroid does not tend to alter the function of the gland, it causes neither hypothyroidism nor hyperthyroidism. A peculiar and interesting feature of thyroid malignancy is that hyperthyroidism seems to protect against it in that the two conditions are seldom associated.

The treatment of malignancy is wide surgical removal followed by irradiation. The experienced surgeon will often be able to suspect or recognize malignancy from the gross appearance of the gland when exposed at operation. If malignancy is suspected then the excision must be as radical as possible. In such cases an immediate frozen section will be helpful. If no malignancy is found, the patient will be spared the added risk of the more radical removal. If malignancy is found, then the surgeon will be confident in proceeding with the most radical removal possible.

In advanced cases palliative surgery is sometimes helpful in relieving pressure symptoms. Irradiation may also be of value palliatively but is not without danger as the resulting inflammation of the larynx and trachea may increase the amount of respiratory obstruction.

Congenital Abnormalities

There are anomalous conditions of the thyroid which are of interest surgically and which sometimes require operation. Thyroglossal duct cysts frequently become infected causing draining fistulas, situated in the midline of the neck usually between the hyoid bone and the thyroid isthmus. Frequently the tract can be palpated extending up the neck toward the tongue. Surgical excision is the only satisfactory treatment. The entire tract must be excised from the opening in the neck to the base of the tongue and in most cases a section of the hyoid bone must be removed.

Lingual goiters are rare but are of great interest surgically. They may or may not be the only thyroid tissue the individual possesses. As a rule they give no symptoms but they are subject to the usual changes that may occur in normally placed thyroid tissue namely inflammation, atrophy, struma, and malignancy. When large or

when subject to some abnormal change, they may cause difficulty in swallowing, breathing, or speaking. When they cause symptoms, they can usually be removed without much difficulty through the mouth.

Lateral aberrant thyroids are particularly prone to become malignant and should, therefore, be removed.

Intrathoracic goiter is rarely an anomalous condition in the true sense of the word but is an extension of the pathologic condition adenomatous goiter. There may or may not be an accompanying hyperthyroidism. The symptoms are those due to mechanical pressure such as dysphagia, dyspnea, hoarseness and cough. Pressure upon the mediastinal veins may cause dilatation of the veins over the upper chest. The treatment is surgical removal.

TREATMENT OF RECURRENT MULTILOCULAR CYST OF THE PANCREAS

Case Report

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PANCREATIC cysts are seen very rarely and multilocular cystic disease of the pancreas occurs even less often. Webb-Johnson and Muir[1] found only 4 cases in 6000 autopsies. Angel[2] had one case in 3600 abdominal sections. Carmichael[3] reports a case of recurrent pancreatic cyst similar to the one included in this paper.

Since not many such patients are seen by any one author, various classifications have arisen. Boyd[4] makes three divisions:

1. Cystadenoma, which are true tumors,

2. Retention cysts, supposed to be due to intermittent partial obstruction as might follow a chronic inflammation,

3. Pseudocysts or collections of inflammatory exudate into the lesser sac as a result of previous injury or necrosis of the pancreas.

Mahorner and Mattson[5] have given a more comprehensive classification as follows:

I. Cysts resulting from defective development.
   1. Cysts in infants
   2. Polycystic disease of the pancreas
   3. Lindau's disease
   4. Dermoid cysts
   5. Inclusion cysts

II. Pseudocyts
   1. Traumatic
   2. Inflammatory

III. Retention Cysts
   1. Calculi
   2. Annular scar formation

IV. Neoplastic Cysts
   1. Cystadenoma
   2. Cystadenocarcinoma
   3. Teratomatous Cysts

V. Cysts resulting from parasites

The case reported below was classified as a retention multilocular cyst. The separation of the cyst cavity into more than one saccule adds difficulties to the operative treatment which will be considered later.

Trauma has been said to be responsible for one-third of all cases. Males are affected more frequently than females. Stevenson[6] reports a patient with a pancreatic cyst developed a few days after an abdominal inury. Acute and chronic interstitial pancreatitis cause pressure on the ducts and infection then produces the retention cyst. Cholecystitis and cholelithiasis also act by occluding the ducts and the end result is the same. Thirty-four to forty-one per cent of Judd's[7] series gave evidence of cholecystitis. The frequency of cholecystitis associated with pancreatic cysts indicates that these cysts are probably residual signs of a process which has involved not only the pancreas but adjacent organs as well.

The patient under discussion had had gallbladder symptoms for years. Functional tests of the gallbladder and two operations revealed that the patient had had a long standing cholecystitis.

The wall of the sac is of a tough fibrous nature. Chronic pancreatitis may be demonstrated in the surrounding tissue. This patient showed a pancreatitis of an interlobular type which was accompanied by loss of the external secretion of the pancreas and digestive disturbances. There was no glycosuria and the blood sugar has always remained normal. In the interacinar type of pancreatitis there is a glycosuria and rise in blood sugar levels.

The contents vary considerably in their appearance. The fluid is ordinarily alkaline in reaction with a specific gravity of around 1.010.[8] The fluid obtained from the cyst of this patient showed only amorphous material with no cells. Usually there is an inflammatory exudate and altered blood. The presence of all three pancreatic ferments does not prove that the fluid is of pancreatic origin and on the other hand many pancreatic cysts contain no ferments.[4]

Wangensteen[9] and Traver[8] have called attention to the possibility of malignancy developing in pancreatic cysts. Since the tumor in this patient had recurred there was a suspicion of cancer but sections removed from different sites showed no signs of malignant degeneration.

Pancreatic cysts do not produce a clear syndrome. Probably most important in the recognition of these cysts is the presence of a smooth mass in the upper abdomen. My patient had the mass but this was thought to be a tumor of the gallbladder since dye study showed an organ that did not function. The usually associated cholecystitis make the picture even more confusing. Roentgen examination should help in differentiating these cysts from stomach tumors. Our pictures revealed a normal stomach and duodenum

with a mass outside of the stomach which caused a changing defect thought to be due to a gallbladder tumor.

Epigastric pain, gas and indigestion are rather common symptoms but produce no characteristic effects. The general health is usually affected so that the patient may be a cancer suspect. This patient had lost twenty pounds. Judd[7] reported that 20 per cent of his cases had had jaundice.

Cysts of nearby organs must be considered in the differential diagnosis. Cysts of the pancreas are as a rule quite immobile. Mesenteric cysts are usually mobile. Kidney tumors may be excluded by urograms.

The treatment of choice is complete removal but due to the difficulty and danger in making such an excision the more conservative operation of marsupialization is usually employed. Judd[7] was able to remove 7 of 47 cysts that he encountered. These were small tumors located in the tail of the pancreas with a narrow pedicle. Most of the isolated cases reported in the literature were treated by marsupialization.

The cyst in this case report was treated by marsupialization and cholecystostomy at the first operation. The patient did well and gained weight for several weeks after the operation. The cyst continued to drain for eight weeks and the cholecystostomy ceased functioning after six weeks. The patient soon had a return of his pain and other symptoms but was able to lead a quiet life for eighteen months until his loss of weight and continued pain caused him to again seek relief. A mass of about the same size as was seen the first time was found in the epigastrium and operation was advised.

A hard, thick gallbladder covered with adhesions was found. Also there was a pancreatic cyst with a diameter of about 10 cm. The cyst was multilocular and pointed through the lesser omentum. The largest sac was marsupialized but several other saccules in the body and tail were apparently unaffected by this procedure. Since it was felt that the cholecystitis played a large part in the etiology of these cysts it was decided to do a cholecystoduodenostomy which might provide a better biliary drainage. The success of this procedure has led me to believe that this plan of treatment deserves consideration in the management of pancreatic cysts.

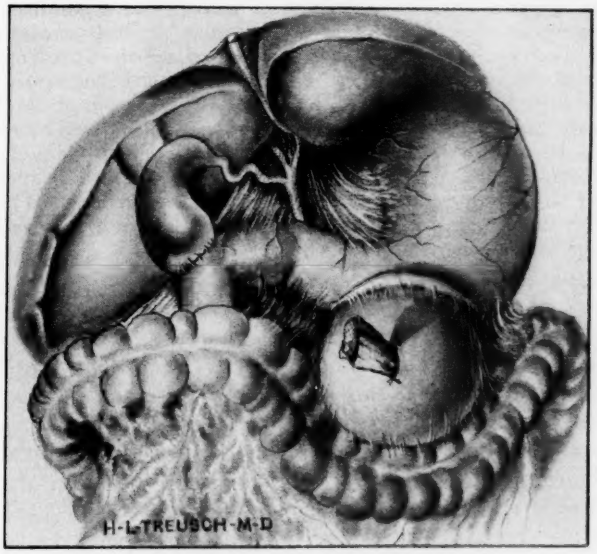
Most authors report that following marsupialization the cysts cease draining after several weeks. X-ray or radium therapy might be of help in closing a fistula.

Angel[2] and Gardin[10] report success following marsupialization in conjunction with a sclerosing agent.

The foreign literature contains many reports of cases treated by cysto-anastomosis. Jedlica[11], Hahn[12], Neuffer[13], Jurasz[14], Brocq[15] and Harries[16] all report cures following anastomosis of the cyst wall with gallbladder, stomach or jejunum. Selman[17] of this city recently reported a case treated by anastomosing the stomach with the cyst.

Report of Case

The patient was first seen in January, 1939. He was a white man aged 59 who had been a farmer all of his life. His chief complaint was epigastric pain which he had had for several months but which this time had persisted for three weeks. He also had noticed the presence of a tender mass in his abdomen. The pain was accompanied by gas, indigestion, nausea, vomiting, loss of appetite and of 20 pounds weight. There had been no jaundice. The pain



Diagrammatic sketch of the second operation.

was not affected by anything he did or did not do. There was no radiation of the pain.

Examination revealed a man who was dehydrated, emaciated and evidently in pain. The abdomen was the only site of abnormal conditions. There was a smooth, rounded, immobile, tender mass in the epigastrium. The tumor was about 12 cm. in diameter. All laboratory tests of blood and urine were within normal limits. X-ray pictures of the chest and alimentary canal were normal. The gallbladder did not fill after the administration of the dye. A diagnosis of gallbladder disease with a possible malignancy was made and operation ad-

vised. This was done four days later, after the patient had been prepared with fluids and transfusions.

OPERATION: Through a right rectus incision a tense, distended, chronically inflamed gallbladder was found. There were no stones. A cyst 12 cm. in diameter which pointed through the lesser sac was found in the body of the pancreas. The cyst was so imbedded in the pancreatic tissue that removal would have been too hazardous. About six ounces of a creamy fluid was aspirated from the cyst cavity. A drain was inserted into this cavity and the walls of the tumor were sutured to the peritoneum. The gallbladder was drained through a stab wound. The fluid was found to contain only amorphous material and no cells. As long as the cyst drained the fluid apparently had no effect on the surrounding tissues.

The gallbladder drained six weeks and the cyst drained eight weeks. The patient did well during this time. A few weeks later he was beginning to have a return of indigestion. Ten months after the operation there was no mass. He was not seen again for a year. At this time he stated that all of his symptoms had returned along with the mass.

He was operated upon through the same incision and a multilocular cyst containing 4 ounces of creamy fluid was found in the body and tail of the pancreas. The cyst was marsupialized and drained as before. A biopsy made from several places in the pancreas showed a chronic inflammatory process with very little pancreatic tissue. The recurrent cyst pointed through the gastrohepatic omentum as had the first. The gallbladder was covered with adhesions. Its walls were thick and hard. It was decided to do a cholecystoduodenostomy in the hope that the increased pressure in the bile ducts which might be a factor in the etiology of these cysts would be relieved. The wound drained for eight weeks but the patient has slowly returned to health with a weight gain of 10 pounds.

SUMMARY

Pancreatic cysts are rare abdominal tumors which should be kept in mind when an upper abdominal mass is found. The surgical procedures used in treating this condition are discussed. The choice lies among marsupialization, resection, cysto-anastomosis, marsupialization with injection of sclerosing fluid and marsupialization with cholecystoduodenostomy. The type of operation should be selected to fit the patient and type of pathology found.

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SCLEROSING OSTEOMYELITIS OF GARRE

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IN 1879 Kluppel reported a case of non-suppurative osteomyelitis occurring in a boy 12 years of age following trauma of the right thigh. A description of this condition was presented by Garré of Tuebinger in 1891, and since that time his name has been associated with this peculiar though not uncommon bone disease. It is said to constitute about 4 per cent of the cases of osteomyelitis in clinics where a large number of patients are treated.

Sclerosing osteomyelitis is a thickening of the cortex of the shaft of a long bone. It is more commonly seen in the tibia or femur of young male adults, and is gradual in its onset usually dating back indefinitely to some injury hardly noticed at the time of its occurrence. The condition is characterized by intermittent recurrences of intense pain. The latter is due to stretching of the periosteum which receives an epicritic nerve supply.

It may well be that the term osteomyelitis is a misnomer, but this disease is so well known by the title given that it is recognized and treated generally as a benign lesion which neither forms pus nor causes sequestration of the involved bone. While some believe it is due to infectious organisms in the haversian spaces which are so attenuated in character as to cause this unusual syndrome, it is more likely that the pathology is due to a diminution in the blood supply locally from some non-infectious irritant, viz. trauma. This results in the piling up of sterile, "scar" bone which has a low vitality. It has been my experience that no organisms can be cultured from the site at the time of operation and without exception the wounds on these patients have healed by primary intention.

On histologic examination the piece of excised cortex shows areas of sclerotic bone encroaching upon the haversian and marrow spaces. Some newly formed bone spicules are present, and among these, dilated capillaries and perivascular round cell infiltration are seen. Indeed the microscopic picture cannot be differentiated from syphilis, but it strongly supports the vascular theory as the origin of this sclerosis.

The clinical manifestations of osteomyelitis Garré usually begin abruptly with swelling and pain locally and moderate temperature elevation. The local pain is out of proportion to the systemic signs, and while considerable infiltration of the soft tissues may be present over the involved bone, there is no reddening of the skin in this area. The roentgenogram shows a thickening and

increased density of the cortex in the shaft of the bone. The size of the medullary canal is decreased and cortical expansion externally is also present. The bone appears smooth and sclerotic with no evidence of destruction present. Kocher believed that a considerable number of bone sarcomas, which were reported to have been cured by amputation, were merely sclerosing non-suppurative osteomyelitis of the long bones. Because of its clinical and roentgenographic similarity to malignant bone neoplasms, thorough study and biopsy is advisable before radical surgery is undertaken on any case. Syphilis can be excluded by negative serologic tests and the failure of this condition to respond to antiluetic therapy. Solid osteitis fibrosa is rarely seen, but may be confused on x-ray appearance if not clinically with osteomyelitis of Garré.

The treatment of this sclerosing type of bone disease is surgical. The operation consists of the removal of a large window of the involved cortex including the periosteum, and tight closure of the wound, no drain being used. Although no purulent material is seen, a culture may be taken if desired. This has been done on every case where symptoms warranted surgical intervention, but as previously mentioned no organisms have been demonstrated. The specimen of bone removed should be examined on microscopic sections by a competent pathologist. This is of paramount importance to exclude sarcoma and endothelial myeloma. Pain disappears soon after the operation and the patient may be allowed to walk as soon as soft tissue healing occurs, wearing a cast or brace to prevent fracture of the weakened shaft of the bone.

Conclusions

Sclerosing osteomyelitis of Garré is a disease entity, probably representing sterile inflammatory bone reaction to an alteration in its blood supply.

The differentiation of this disease from malignant neoplasms is of great importance in preventing the needless amputation of limbs.

Local surgical intervention is indicated for the relief of pain and to obtain a biopsy.

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THE TREATMENT OF VARICOSE VEINS OF THE LOWER EXTREMITIES

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OUR treatment of varicose veins in the clinic of the Louisville City Hospital is based purely on the altered mechanics of the superficial venous system. Normally this system does not permit any backflow and blood drains from the superficial to the deep veins. But in varicosities the flow can usually be demonstrated, some place along the line, to be directed backward from the deep to the superficial system as the result of incompetent valves. A classification is made on the basis of this reverse flow and this classification will be brought out later in this paper.

The symptoms most often encountered are heaviness of the legs and swelling of the feet and ankles after long standing. The numerous other complaints are usually referable to the complications of varicosities. However, it is for the complications that the majority of clinic patients present themselves. The dull, aching, localized pain over obviously enlarged and dilated veins is referable to periphlebitis or a localized thrombophlebitis. The pruritus, pigmentation, and history of sores that do not heal, are evidence of long-standing varicosities with complicating pathologic changes. Tissue damage obviously affects the prognosis.

The family history is particularly important, both statistically and for the purpose of securing cooperation. The vivid picture of a close relative who is an invalid to long-neglected varicose veins helps to maintain the interest of the patient. The thickened legs, marked pruritus from static dermatitis, brawny induration, and even ulceration of the relative, will help the surgeon. These cases are pointed out to the patient as evidence of the progressive nature of the disease.

In selecting cases for treatment we have found few conditions rendering the surgical interruption of the backflow inadvisable. Edwards[2] considered there were very few contraindications to the treatment of varicose veins of the lower extremity. He mentioned recently subsiding phlebitis and certain cases of deep phlebitis. Provided the patient is ambulatory, we agree with this author. However, we have done few ligations during pregnancy and we have generally treated these patients conservatively, with six exceptions. In these cases the varicosities were marked and the swelling of the ankles was pronounced on the affected side. High

From the Varicose Vein Clinic, Surgical Department of the University of Louisville Medical School and the Louisville City Hospital.

saphenous ligation at the saphenofemoral junction was done with relief of symptoms. Retrograde injection was not tried in any of these cases. In one case of seven months' pregnancy the saphenous was ligated at the junction of the middle and lower thirds of the thigh affording the woman temporary relief from the back pressure. Following the termination of pregnancy a high saphenous ligation will be done. No untoward effects on the pregnancies were noted.

The treatment depends on the state of the superficial and deep veins as shown by the various tests. In each case prior to obliterative treatment the patency of the deep veins is tested. One or more elastic bandages are fitted snugly about the extremity from the toes to the upper thigh and the patient is asked to walk for approximately half an hour. The superficial veins being collapsed, the patient should tolerate the exercise with no discomfort. If, however, there is marked discomfort, it points to an obliteration of the deep circulation and hence a complete shutting off of the venous return. The failure of the patient to tolerate this test is regarded as a contraindication to further treatment. However, the mere history of a deep phlebitis is not regarded as a contraindication to the therapy of superficial varicosities. Luke[7] reports two cases with histories of deep phlebitis in which he performed high saphenous ligations combined with short saphenous ligation in one of the cases. The results were good. He did not state whether he tested for the patency of the deep circulation. I presume it was patent in both cases. In one of our own, with patency of the deep circulation but with a definite history of deep phlebitis, the result was also good following saphenous ligation.

The treatment of the varicosities depends on the classification of them derived from tourniquet tests. If the Trendelenburg test is singly positive, the case is classified as merely an incompetent long saphenous vein and cure should be affected by merely the high ligation of the saphenous. However if the Trendelenburg is doubly positive, an attempt is made to ascertain why the varicosity fills despite the application of the tourniquet in the upper thigh. Obviously a backflow from the deep circulation must occur below the point of application of the tourniquet. The attempt to find the locations of incompetent communicating veins is made by a modification of the Trendelenburg test, as suggested by Barrow.[1] With the patient lying down, blood is removed from the extremity by elevation of the leg. Three tourniquets are then applied,

No. 1, just below the knee,
No. 2, just above the knee,
and No. 3, high on the thigh.

The patient then stands quickly. Filling of varicose veins below the lowest tourniquet must indicate incompetence of the communicating veins of the leg. The lowest tourniquet is removed first. If filling takes place, the short saphenous may be involved. If filling takes place only after the removal of the second tourniquet, the incompetence must exist between tourniquets 2 and 3 (on the thigh). Finally the removal of the highest tourniquet establishes the presence of an incompetent long saphenous and is similar to a Trendelenburg test. This test is combined with that described by Mahorner and Ochsner[8] and the case is classified (1) mechanically and (2) pathologically.

For instance (1) Incompetent long saphenous of the right leg.
(2) Edema of the right ankle, or
(1) a. Incompetent long saphenous of the right leg.
b. Incompetent short saphenous of the right leg.
(2) Ulcer of the medial aspect of the right ankle, etc.

Treatment based on the above diagnoses is primarily surgical. This is because of the now acknowledged failure of injection treatment alone. Howard, Faxon,[4,5] Kettel, and others have shown a high rate of recurrence in case series. Experimentally Ochsner and Garside[10] showed a 94 per cent canalization of the small total number of veins (13.4 per cent) they were able to produce thrombi in. In a small percentage of cases the varicosities have not been definitely shown to be the result of backflow from the deep veins. These so-called "flares" have been occasionally injected without any surgical treatment, but in most of these instances if the patient is asymptomatic, he has been placed under observation. The feeling has been that if the patient should later develop swelling of the ankles or other signs, we would still have veins large enough to make an intelligent diagnosis.

The treatment adhered to has been high ligation of the saphenous vein at the saphenofemoral junction. The technic of the ligation has been adequately described by Faxon,[4] Pratt,[11] and others. Certain points important to this author are presented.

The patient is prepared with green soap, saline, ether, and merthiolate, and draped. The fossa ovalis is located one inch lateral and one inch inferior to the pubic tuberosity. This location of the fossa has been proven very accurate and more consistent a landmark than relying on the site of the femoral artery, which cannot be palpated in a definite percentage of cases.

The area is then thoroughly infiltrated with as much as 80 c.c. of 1 per cent procaine hydrochloride. The incision is made through the mark locating the fossa ovalis parallel to the inguinal ligament

and with this mark as the center. The saphenous vein is then found by blunt dissection, care being taken to separate the superficial fascia in the long axis of the leg so as not to cut across lymphatics. (When we first started the ligations we removed lymph glands, once doing a block dissection. Our first four clinic operations developed indurated wounds, falling away of the edges of the wound, and draining lymph sinuses. Two of these patients for several months had swelling of the ankle on the operated side. Since abandoning the biopsy and the added care in dissection we have had no more complications.)

The vein is cut between clamps and the proximal end is followed to the femoral which is definitely identified. All branches encountered are divided and ligated, and saphenous then divided and ligated close to the femoral and proximal to the last tributary. Care in this step prevents the formation of a collateral circulation.

If retrograde injection is to be done, we prefer the method of Pratt.[11] He introduces an ureteral catheter as far down the saphenous as it will go (40 to 60 cm.). A sclerosing solution which can be tolerated in large amounts is used and an attempt is made to inject it uniformly. The above mentioned author used about 40 c.c. of 3.5 per cent sodium ricinoleate. My choice has been "varisol." This method prevents the "spotty" thrombosis of the veins seen with the usual 4 c.c. of sodium morrhuate and tends to give a uniform and thorough thrombosis of the saphenous system. The skin is then approximated with interrupted vertical mattress sutures. After the wound is dressed, elastic bandages are wrapped snugly from the toes to mid-thigh and the patient is made to walk. After large amounts of sclerosing solution the patient should be kept under observation, and pressure bandages applied if areas of undue reaction appear.

Where the patient is not under direct observation we have not used the retrograde injection. This precaution lengthens the number of postoperative injections necessary for complete obliteration. Heyerdale and Stalker[13] have recently written of clinic patients treated by retrograde injections of sodium morrhuate and they report no untoward results.

Where the diagnosis indicates further altered mechanics we have supplemented high saphenous ligation with segmental ligation of the saphenous a few inches above the knee as suggested by Mahorner and Ochsner,[8] and with ligation of either the short saphenous or blow-outs as indicated by the tourniquet tests.

To date we have not had occasion to use the Linton[14] operation for the dissection out and ligation of communicating veins of the

leg. Our material coming as it does from lower economic groups, some of whom have a tendency to neglect themselves, will probably soon give us cases which can be cured only by this treatment.

SUMMARY

1. The treatment of varicose veins is presented.

2. Therapy is based on the altered mechanics of venous circulation and is primarily surgical in nature.

3. The method of retrograde injection described by Pratt is advocated by this author.

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ACUTE PERFORATED DIVERTICULITIS OF THE SIGMOID

Case Report

R. L. SANDERS, M. D.

Memphis

Mr. E. P. B., aged 60 years, was referred because of severe pain in the lower abdomen, of two days' duration, associated with local tenderness and a palpable mass. The pain had begun suddenly, following a dose of purgative which he had taken for constipation. Soon after its onset, he had had a chill, with an elevation of temperature and nausea and vomiting. A few hours before entering the hospital, an enema had been given, and before it was completed he was seized with an even more violent pain in the left lower abdomen. This pain was unremitting and was not completely relieved by large doses of morphine. The patient and his family thought the enema had precipitated the second attack and that possibly a perforation had occurred.

When first seen, the patient appeared quite sick and was suffering intensely. He had a temperature of 102 degrees, and his pulse was rapid. His chest was negative. The abdomen was moderately distended and rigid, and a mass was palpated in the sub-umbilical region near the midline. It was believed that the first attack of pain, two days earlier, was brought about by a perforation, and that the more recent attack represented an extension of the perforation. Since the localizing process was apparently well under way, it was considered unwise to open the abdomen immediately. Conservative treatment, including sulfanilamide, the intravenous administration of fluids, and opiates to keep the patient comfortable, was carried out for twelve days. By the end of that time, the localization was complete and the peritonitis well under control.

The operation was performed under sodium pentothal anesthesia, through a short low midline incision. The sigmoid was found in the midline and was folded on itself, walling off and protecting an abscess which contained a large amount of fecal material and pus. The cavity was evacuated, drains were inserted, and the wound was closed. No attempt was made to locate the perforation or determine its cause. A short transverse incision was then made above the umbilicus, and a loop of the transverse colon was drawn out for a colostomy. A limited exploration revealed no evidence of malignancy in the omentum or surrounding bowel. Two days later, the loop was opened with the cautery, and a good colostomy established.

The patient was given sulfanilamide, blood transfusions, intravenous infusions, and other supportive treatment for several days, to which he responded well. At the end of two weeks, bowel irrigations were instituted; the escape of fluid through the abdominal sinus as well as through the colostomy opening indicated that the perforation was still unhealed. After an additional two weeks, he was dismissed from the hospital, with instructions to continue the irrigations at home.

A few days later, he had an unexplained attack of epigastric pain, with chills and fever, necessitating his return to the hospital. Under treatment with sulfanilamide, the attack soon subsided, and he again returned home.

The patient was next seen three months later. He had gained ten pounds in weight and his general condition was much improved; he complained, however, of a sense of obstruction in the region of the perforation. Roentgenograms made after a barium enema revealed that the perforation was still present, though much smaller in size, and the lumen of the bowel was narrowed in this area. A few small diverticula were also observed along the left half of the colon. It was thought best to postpone further surgery for another month. We were as yet undecided whether the perforation should be closed or resection of the diseased segment would be advisable.

Five months after the first operation, under sodium pentothal anesthesia, the original incision was reopened for exploration of the abdomen. It was necessary first to free a few loops of the small intestine which had become adherent about the fistulous tract. The sigmoid was then carefully examined and the perforated diverticulum found at the mesenteric border in the midportion. A few other diverticula were scattered along the segment, but were so small as to be of no consequence. Although the bowel wall was rather thick, the lumen was adequate, and it was definitely established that the condition was an inflammatory process secondary to the perforated diverticulum. By reason of these facts, and the risk of the more formidable procedure of resection, closure of the perforation was considered best. After freeing the sigmoid from the surrounding structures, therefore, the fistulous tract was excised and the opening sutured with two rows of catgut and covered with fat. One hundred grains of sulfanilamide was poured into the peritoneal cavity and the wound was closed. Drainage was established through a stab wound to the right.

Two weeks later, clamps were applied to the spur of the transverse colon, and ten days thereafter the colostomy was closed. Following suture with two layers of chromic catgut, the loop was sunk beneath the abdominal wall. With through-and-through sutures of silkworm, the edges of the incision were then brought loosely together, acriflavin gauze was packed into the wound, and the sutures were left untied. At the end of 48 hours, the pack was removed and the sutures tied. Bowel function was reestablished within a few days, the wound healed by primary union, and the patient left the hospital in good condition, two weeks after the closure of the colostomy. Subsequent examinations have shown the lumen of the colon to be ample throughout and function has remained satisfactory.

Comment

Uncomplicated diverticulitis of the colon rarely becomes a surgical disease. When perforation occurs, it usually does so at the outer side of the sigmoid, an abscess forms by localization of the process, and the surgical treatment is limited to drainage of the abscess. Occasionally, however, when the sigmoid is well over in the middle of the abdomen, perforation takes place into the peritoneal cavity and is followed by a generalized peritonitis, or, as happened in the above case, localization of the infection.

Several features of this case are believed of sufficient interest to deserve special mention.

1. The acute perforation was probably precipitated by an enema, the pressure on the lumen of the bowel extending the perforation which has already occurred and was localized and protected. This serves to emphasize the fact that one should be exceedingly careful about advising an enema when diverticulitis is suspected. Especially is this true of a barium enema for roentgenographic study. I have seen three fatalities from generalized peritonitis following perforations produced by barium enemas given for visualization of the colon.

2. At the time of incision and drainage of the abscess, no exploration was made to determine the cause of the catastrophe. Even though one is uncertain as to the exact nature of the disease, the surgical procedure in such cases should be limited to drainage alone.

3. A transverse colostomy was made to divert the fecal current proximal to the perforation, to prevent further spread of the infection, and to permit the abscess cavity to heal.

4. When the abdomen was explored, five months after the original operation, the lumen of the bowel was found adequate, and believing the condition was benign, a resection was not considered necessary. The patient's subsequent course has proved the wisdom of this decision. Often, in these cases, however, it is debatable whether a segment of the bowel should be removed or a simple closure of the perforation is indicated.

5. The generous use of sulfanilamide during localization of the process was most effective in the control of the peritonitis. Later, when the perforation of the sigmoid was closed, the use of sulfanilamide intraperitoneally materially facilitated healing.

6. Finally, attention is called to the delayed closure of the colostomy wound. I have employed this procedure in colostomy wounds for a number of years and strongly recommend it for promoting primary union. I have never reported my experience; Drs. Frederick A. Coller and William L. Valk, of Ann Arbor, however, presented the subject before the Southern Surgical Association in 1939. Their method is identical with mine and their results similar. By packing the wound with an antiseptic gauze, allowing the sutures to remain untied, and 48 hours later, removing the gauze and tying the sutures tight, primary union will take place in practically every case.

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THE DOCTOR AND THE NATIONAL EMERGENCY

The paramount question in the minds of medical men is, "What is expected of the medical profession during the war and how can we best help defeat Hitler quickly?" The completed program of the Thirteenth Annual Assembly of The Southeastern Surgical Congress will be mailed out about March 1. It is the intention of the Program Committee to make this a War Time meeting and most of the discussion will center around:

1. The medical profession and civilian life during war time.
2. The medical profession and industry during war.
3. Medicine and surgery in Army and Navy training camps.
4. Medicine and surgery in combat zones.

There is a grave possibility that more than 30,000 doctors will be needed in the military camps and in the war zone. This means that the majority of the young and middle-aged physicians will be in the Army and Navy. Medical teaching units must be left behind. The Public Health Departments must have more physicians. To what extent will the rural population be cared for if the doctors in those communities are accepted in the Army? Already the quota of physicians in these communities is far too low for adequate medical attention. The farming communities must be taken care of, if the nation would be fed. The Program Committee is making an effort to secure a representative from the Office of Procurement and Assignment in Washington.

It is important that industry not be handicapped by poor health conditions among the workers employed in making war material. Indeed, more will be demanded of these workers, longer hours and extra days. Therefore, greater medical care will be necessary to

keep them fit. Lines of transportation and communication will be taxed to the limit. Manpower is necessary to make machine power available.

These phases of the preparedness program will be covered in our program. I quote from Dr. Lahey in the Journal of the American Medical Association:

> The establishment by the government of a Procurement and Assignment Agency properly places the responsibility for obtaining medical personnel in the hands of the medical profession. The success of this agency depends entirely on a few basic features: The complete co-operation of medicine in what even the most doubting must now admit is a truly national emergency; and unqualified willingness to serve the country however, wherever and whenever required; and a firm purpose to establish the fact that medicine intends to maintain its place in the forefront as it always has when a patriotic example is of such significance.

The medical profession will do its part!

B. T. BEASLEY, M. D.

COME TO ATLANTA

With associates and assistants gone to war, and a lessening in the volume of practice, it might be thought that this is an inopportune time to hold a surgical meeting. We think the opposite opinion is correct, and it is an excellent time for a meeting, especially the kind The Southeastern Surgical Congress proposes to put on in Atlanta, March 9, 10 and 11.

There are two paramount reasons why the meeting is appropriate during the present critical, busy season: first, because many papers deal with surgical problems as affected by war, presented by men whose experience qualifies them to speak on such subjects; and second, because of the strenuous days and nights which we have passed through in the past few months we need the relaxation which attendance at such a gathering always brings.

A great deal is being said and written these days about "keeping up the morale." During the past few years the English have furnished a sublime example of this precious asset, and their amazing success in repulsing a powerful enemy no doubt is as much due to sustained morale as to the machines of warefare. Members of the medical profession need to develop this indispensable quality as well as the soldiers on the firing line. Getting away from the exhausting routine of an active practice for a few days is an effective and happy means of sustaining morale.

While the main object of going to a medical or surgical meeting is to learn something new, or to renew one's acquaintance with old things which are still good, the social contacts constitute a most important feature to be cultivated. One not only learns much of medicine by such intimate associations, but also is thus enabled to make new friendships or renew old ones.

One of the leading surgeons in America rarely misses a large surgical meeting, but he is not often seen in the meeting hall hearing papers. Instead he spends most of his time talking to members outside the place of meeting, or listening to their conversation. By this method he claims to learn more, and with less effort, than by listening to papers. While this plan is not recommended to all who go to medical meetings, it offers a different way of benefiting from such gatherings, and one which might be adopted to a limited degree.

On the program of the Thirteenth Annual Assembly of the Congress will be found the names of many of the high lights of American medicine and surgery. Leading the list will be Dr. Fred W. Rankin, President-Elect, American Medical Association; Mr. Paul V. McNutt, Federal Security Administrator, and Colonel Leonard G.

Rountree, of the Medical Corps, United States Army. Internal medicine will be represented by a former President of the American Medical Association, Dr. James S. McLester, and Dr. Russell Wilder, of the Mayo Clinic.

The full program is published elsewhere. Dr. Dan Y. Sage, perennial chairman of the Program Committee, has done an especially good job this year, but has been handicapped by the withdrawal of speakers due to emergencies occasioned by the War. An unusually large number of speakers was selected, however, so that even if the vacancies cannot be filled by men of equal ability and reputation, the program will be a full one.

Among addresses bearing on military surgery are: "Early and Late Treatment of Injuries of the Face and Jaws," by Dr. Robert H. Ivy; 'The Part of the Railroad Surgeon May Play in National Emergencies," by Dr. Joseph D. Collins; "The Medical Profession of the South in Time of War," by Dr. Julian L. Rawls; "Chemotherapy as an Adjunct to Surgery," by Dr. Arnold S. Jackson, and others.

Many Fellows of the Congress having expressed themselves as being tired of banquets, it was decided this year to offer a different type of entertainment Tuesday evening, March 10. Advantage has been taken of the fact that the year 1942 marks the centennial of the first use of ether as an anesthetic in surgery to produce a play based on the life and work of Crawford W. Long, whose operation under ether was performed at Jefferson, Georgia, March 30, 1842. The play will be given at the Atlanta Woman's Club by a capable amateur company, the Atlanta Theater Guild. The story of Long's achievement lends itself easily to dramatic treatment so that an interesting play may be expected.

The Atlanta Fellows of the Congress and the 520 members of the Fulton County Medical Society extend a cordial welcome to visiting Fellows and to all other members of the profession who attend the meeting. The Congress was organized in Atlanta, and we are assured that its thirteenth annual convention will be the unqualified success which all predecessors have been. The Fulton County Society will be particularly proud to show its new Academy of Medicine home, one block away from the Biltmore Hotel.

No matter what one's business or profession may be, the paramount issue before all of us, and our most vital concern at the present time, is to help our country win the War. Some will bear arms, some will care for the sick and wounded, but all may help by doing his present job better than ever before. In the case of the doctor this means not only administering to our patients but

also studying harder than ever before, and endeavoring to keep up with the times. This Postgraduate Surgical Assembly offers a refresher course which will furnish results far surpassing anything to be gained from long hours of reading. Atlanta awaits you. Come!

FRANK K. BOLAND, M.D.

CHICAGO SELECTED FOR 1942 CLINICAL CONGRESS OF THE AMERICAN COLLEGE OF SURGEONS

Because of the War, the thirty-second annual Clinical Congress of the American College of Surgeons will be held in Chicago October 19 to 23, instead of in Los Angeles as originally planned. Headquarters will be at the Stevens Hotel. The twenty-fifth annual Hospital Standardization Conference sponsored by the College will be held simultaneously. The programs of both meetings will be based chiefly on wartime activities as they affect surgeons and hospital personnel in military and civilian service.

ADDENDA TO THE ROSTER

of

THE SOUTHEASTERN SURGICAL CONGRESS

as of December 8, 1941

In some way, as unfathonable as unpardonable, as mysterious as regrettable, names of Fellows in good standing were left out when the 1941 Roster of The Southeastern Surgical Congress was published in the January issue of THE SOUTHERN SURGEON. ***Our most profound apologies are offered to these gentlemen and with deep humility we now publish their names.***

LOUISIANA

SENIOR FELLOWS

DR. P. B. SALATICH....1228 Maison Blanche Bldg., New Orleans
DR. J. T. SANDERS.....4414 Magnolia Street, New Orleans
DR. R. O. SIMMONS.....630 Washington Ave., Alexandria
DR. J. G. SNELLING.....320 North 3rd Street, Monroe
DR. A. H. STORCK.....1458 Nashville Ave., New Orleans
DR. G. J. TAQUINO.....1313 Canal Bank Bldg., New Orleans
DR. C. H. TYRONE.....3503 Prytania Street, New Orleans
DR. E. B. VICKERY.....1107 American Bank Bldg., New Orleans
DR. W. A. WAGNER.....914 American Bank Bldg., New Orleans
DR. H. W. E. WALTHER.1324 Whitney Bank Bldg., New Orleans
DR. R. W. WRIGHT.....611 Hibernia Bank Bldg., New Orleans

JUNIOR FELLOWS

DR. H. H. HARDY, JR.....531 DeSota Street, Alexandria
DR. R. E. KING.....Winnsboro
DR. C. H. WILSON.....Charity Hospital, New Orleans

BOOK REVIEWS

The Editors of THE SOUTHERN SURGEON *will at all times welcome new books in the field of surgery and will acknowledge their receipt in these pages. The Editors do not, however, agree to review all books that have been submitted without solicitation.*

EPILEPSY AND CEREBRAL LOCALIZATION. By WILDER PENFIELD, Litt. B., M. D., Professor of Neurology and Neurosurgery, McGill University; Director of the Montreal Neurological Institute and THEODORE E. ERICKSON, M.A., M.Sc., M.D., Ph.D., Associate Professor of Surgery, University of Wisconsin. 623 pages. Price, $8. Springfield: Charles C Thomas, Publisher, 1941.

More than any other man, Dr. Wilder Penfield has brought hope to those thousands of tormented sufferers from the great group of conditions which go under the all-inclusive name of epilepsy. His brilliant pupil, Theodore Erickson, has also made numerous valuable contributions to this subject.

The former contributions of these authors to this field have been concerned primarily with the "weeding-out" from the great mass of "idiopathic" epileptics of a large number of patients suffering from convulsive disorders, but whose seizures are the result of localized and often removable disease of the brain. The present volume embodies the result of their long research and experiments.

It is essentially a clinical dissertation but the subject is approached with masterly scholarship and thorough going scientific background and documentation. Of particular interest are the initial chapters on cerebral physiology, the chapter on the atrophic eleptogenic lesions and the chapter on electroencephalography. The latter chapter was contributed by Dr. Herbert H. Jasper of the Montreal Neurological Institute and is a highly practical consideration of this new and important diagnostic device.

There is also an interesting chapter entitled "Psychological Studies of Patients with Epileptic Seizures" by Dr. M. R. Harrower-Erickson.

The careful student of this book will know most if not all about the important convulsive disorders.

There is a splendid bibliography and an excellent index.

COBB PILCHER, M. D.

SURGERY OF THE HEART. By E. S. J. KING, M.D., M.S., D.Sc. (Melb.), F.R.C.S. (Eng.), F.R.A.C.S., Major A.A.M.C., Honorary Surgeon to Out-Patients, Royal Melbourne Hospital; Jacksonian Prizeman, Royal College of Surgeons; Sometime Stewart and Senior Lecturer in Pathology and Stewart Scholar in Surgery, University of Melbourne. Price, $13.50. Baltimore: The Williams & Wilkins Company, 1941.

Since December 7 Americans have become more acutely conscious of Australia than ever before and the bonds between the two countries are strengthening. It is not improbable that more of our fellow citizens will visit that distant land in the next few years than ever before. It is therefore pleasant and most

timely to be reminded of the caliber of scientific medicine that comes out of there.

Major King's work is in many respects a model surgical monograph. The first section deals successively with the embryology, comparative anatomy, gross anatomy, developmental abnormalities, histology, physiology, pathology, radiology and electrocardiography. He will be a rare internist, even though particularly interested in cardiology, who will not learn a great deal from this part. It is extraordinary to see how carefully he has covered the literature of the world.

The second section will perhaps prove of greater value to the internist than to the general surgeon, for while there are still few surgeons who care to operate on the heart, the medical man will be interested to learn just what benefit may be expected from surgery for his cardiac patients, provided he can find a surgeon competent to operate in this field. On the other hand, tapping the distended pericardium or even opening it for purulent effusion should not be too formidable an operation, and operations for stabs of the heart are rather frequently required of surgeons in the South even in times of peace. In times like these its importance is many times multiplied.

One must remark that not only is the book well written but also that it is extraordinarily well illustrated: it is indeed a pleasure to see so few hackneyed figures, such a wealth of original photographs. The bibliography is extensive.

The reviewer for another journal has intimated that this book was premature: that too few operations had been performed for certain conditions of the heart for the statistics to be of much value. Such an argument carried to its logical conclusion would deter one from writing any books except about such subjects as Euclidean geometry or Latin grammar. To us the charm of medicine is that it is a living subject: granting that in another twenty years much of the surgery in this book will probably be of only historical interest, we feel that the stimulus of this work will do much to advance cardiac surgery and to make itself out of date. We therefore welcome it and heartily recommend it.

THE BLOOD BANK AND THE TECHNIQUE AND THERAPEUTICS OF TRANSFUSIONS. By ROBERT A. KILDUFFE, A.B., A.M., M.D., F.A.S.C.P., Director, Laboratories, Atlantic City Hospital; City Bacteriologist, Atlantic City; Serologist, Municipal Hospital for Contagious Diseases, Atlantic City; Pathologist, Atlantic County Hospital for Tuberculous Diseases; Serologist, Betty Bacharach Home for Crippled Children; Serologist, Jewish Seaside Home, Atlantic City, etc.; Formerly, Major, Medical Corps, United States Army, and MICHAEL DEBAKEY, B.S., M.D., M.S., F.A.C.S., Assistant Professor of Surgery, School of Medicine, Tulane University of Louisiana; Visiting Surgeon, Charity Hospital, Touro Infirmary, and Mercy Hospital, New Orleans; Associate in Surgery, The Ochsner Clinic, New Orleans. 558 pages, with 214 illustrations and one color plate. Price, $7.50. St. Louis: The C. V. Mosby Company, 1942.

It wasn't so many years ago that a transfusion made the front page of every newspaper; somewhat later transfusion was rarely performed except as a sort of last rite on moribund patients so that the patient's family might have the satisfaction of knowing that "everything had been done." Today the patient's family is hardly perturbed by the suggestion of a transfusion: perhaps we doc-

tors are beginning to take the operation a little too casually. We should be reminded that, much as may be expected from transfusion, it is not a procedure to be undertaken without great care. We should be reminded too that one case of syphilis from transfusion is too many, and that catastrophe still happens.

Even though many members of the profession may have been satisfied with their knowledge of transfusion, its indications and technic, it is to be feared that many doctors knew as little about how to start a "blood bank" as did this reviewer a few days ago. And what attention the "blood bank" idea has attracted from the laity! The rather recent introduction of plasma into the armamentarium has also required an extension of knowledge.

A book then devoted to this subject should have been welcomed six months ago. Now that we are at war, it is our belief that an authoritative discussion of transfusions in the broadest sense is about the most valuable book that could be brought out. Drs. Kilduffe and de Bakey write clearly and give abundant detail. They illustrate everything. They have produced a work that, if only by reason of its timeliness, is a masterpiece.

DISEASES OF WOMEN. By HARRY STURGEON CROSSEN, M. D., F. A. C. S., Professor Emeritus of Clinical Gynecology, Washington University School of Medicine; Fellow of the American Gynecological Society, etc., and ROBERT JAMES CROSSEN, A. B., M. D., Assistant Professor of Clinical Gynecology and Obstetrics, Washington University School of Medicine; Diplomate of American Board of Obstetrics and Gynecology, etc. Ninth Edition, Entirely Revised and Reset, 948 pages, with 1127 Engravings, including 45 in color. Price $12.50. St. Louis: The C. V. Mosby Company, 1941.

The fact that this book is now off the press in its ninth edition bears testimony to its appreciation by the profession in the past. The opening of the book concerns itself with the anatomy and physiology of the essential organs involved in gynecology, namely, the ovaries, fallopian tubes, uterus, and vagina. There is a full, but general, description of the gross and microscopic anatomy of these structures, including ligaments, blood supply, lymphatics, and nerves. The presentation of physiology is abreast of the times, in spite of the great flux in that particular field. Endocrine relations of these organs with ovarian, pituitary (growth, thyrotropic, adrenotropic, lactogenic, pancreotropic, oxytocic, and others), thyroid, adrenal cortex, and chorionic hormones are clearly and fairly concisely set forth. This section is full of illustrations of anatomic relations and diagrams of hormonal relations and resulting changes in the organs affected. There is a full description of menstruation.

Requisites for a proper gynecologic diagnosis, as set forth by the authors, are a knowledge of anatomy and physiology of the organs involved, reliable history and examination, knowledge of pathologic processes taking place in these parts, and an understanding of the differential diagnosis and treatment for whatever may be the cause of the trouble. Thus, in a case with symptoms referred to the lower abdomen or back, one must consider the digestive, the urinary, the skeletal, the nervous, and the genital systems.

Lesions of the genital system are usually either of the "inflammatory symptom-complex" or of the "new growth" type. Characteristics of these

two large categories are set forth. The instability of the subjective element on the part of the patient is brought out. The value of a history and clear record is emphasized.

The authors use a logical procedure in the evaluation of physical findings. For example, prominence of the abdomen may be caused by (a) some affection of the abdominal wall, (b) something in the intestines, (c) something in the peritoneal cavity, (d) some enlarged organ, or (e) tumor of the pelvis or abdomen. Under (a) affection of the abdominal wall may be considered obesity, tumor, inflammatory mass, ventral hernia, relaxation, and separation of the rectus muscles.

The examination of the abdomen as presented in this book includes inspection, palpation, percussion, auscultation and menstruation. Deviations from normal conditions under any of these procedures are analyzed by deductive logic as is prominence of the abdominal wall above. Regional anatomy with associated signs and symptoms is considered. Specific causes for different types of discharge (mucoepithelial, mucopurulent, purulent, bloody, watery) are set forth. Common errors in examination are mentioned (as, in palpation of the body of the uterus, the bladder may not be empty; the abdominal hand may be moved about too much causing increased rigidity of the muscles, or the abdominal hand may be too close to the symphysis). Facts to determine in a procedure are listed (as, in palpation of the body of the uterus, one determines position, size, shape, consistency, tenderness, mobility, and attachment).

Technics are described critically and analytically—as examination with the speculum or colposcope, the iodine test, determination of pH, biopsy technic, and gas test for patency of the tubes.

In the same orderly manner, therapeutic measures are considered categorically under the headings of endocrine, vitamine, bactericides, hemostatics, plasma balance, allergy treatment, thermotherapy, and neuro- and psychotherapy, and local measures.

Considered in the book are diseases of the external genitalia and vagina, relaxation and fistulae, displacements of the uterus, inflammatory and metabolic disturbances of the uterus, non-malignant tumors of the uterus, cancer of the uterus, pelvic inflammation, diseases of the ovary and parovarium, malformations, menstrual disturbances, sterility and sexual disturbances, miscellaneous disturbances, and medicolegal points in gynecology. The book contains a list of over 800 references and an index of 28 pages. The correct pronunciation of the word "gynecology" is also given on the first page.

CANCER OF THE FACE AND MOUTH, Diagnosis, Treatment, Surgical Repair. By VILRAY P. BLAIR, M. D.; SHERWOOD MOORE, M. D., and LOUIS T. BYARS, M. D., St. Louis. 599 pages, with 264 photographic illustrations, 216 pages on operative technique with 64 large plates showing procedures in removal and repair of affected areas, and a full 9-page index. Price $10. St. Louis: The C. V. Mosby Co., 1941.

This handsome book represents the latest knowledge of methods of diagnosis and treatment of cancer of the face and mouth. A more accurate portrayal of the contents of the book may probably be obtained by presenting

some of them to the reader of this review—some as they occur in the book and some as they occur within the mind of the reviewer:

The author states that present-day public opinion gives radiation a better break than mass surgery in the treatment of cancer, since the patient may wish to postpone the surgical act—while radiation may be undertaken immediately, probably, in many cases, stopping growth that would have taken place in the delay before radical surgery. He observes that, from the tremendous strides in radiotherapy in the last two decades, it is not unreasonable to hope that this or some other agent may "ultimately supersede the mass destruction of even cancerous lymph nodes."

Although one cannot absolutely differentiate between curable and non-curable cancer, one should substitute other measures for surgery in some cases, as a death under the knife may dissuade some curable patient from radical treatment which may be the only means of saving his life. Too often one sees proudly exhibited an almost intact mandible, from symphysis to condyle, with a small tag of cancer attached, and observes that the major portion of the relic is not involved with the malignancy. In these cases, most likely the clean incision left infected soft tissues behind.

". . . Each individual lip cancer is an individual problem." Treatment should depend upon the age and condition of the patient, the nature of previous treatment, the duration of the lesion, the rate of growth and change in rate, lymph nodal involvement, and the physical characteristics of the primary lesion. "There are three methods of attack on cancer, first, surgical, second, radiotherapy, and third, destruction by the action of chemicals. The third of these is mentioned chiefly to be condemned." Dr. Blair finds it sad that there is such widespread doubt of the effectiveness of surgical treatment of palpable nodes, since he obtained cures of 23 per cent, 36.6 per cent and 55 per cent in three series of patients with nodal involvement. The average treatment of cancer is not up to the standard that it should be, since a large percentage of serious cases have been poorly treated when they were of a less serious nature.

Patients with leukoplakia are advised to avoid the three "S's"—spices, spirits, and smoke. Lesions in the mouth showing chronicity, induration, and ulceration, should be suspected, if not diagnosed, as cancer. In the authors' opinion, the role of tobacco in the production of cancer is generally exaggerated, but one should beware of the "nicotine blister" occurring at points of frequent contact with tobacco, pipe, or a stream of hot smoke. Negative biopsy reports may be misleading since malignant tissue may not have been included in the specimen. Similarly, a specimen showing a low malignancy on microscopic examination may belie the nature of other portions of the process. The malignancy or degree of malignancy may be masked by infiltration of the specimen with inflammatory cells. It is an old rule that cancer growing toward the observer is less malignant than cancer growing toward the patient. A nice ulcer with a smooth base is likely more dangerous than a humped-up warty repulsive one—showing that all that glitters is not gold. The author has never seen a hair-bearing mole undergo malignant change.

Included within the book are chapters on cervical node metastasis and neck dissection, anesthesia, follow-up statistics of cancer cases (analysis of therapeutic measures, comparison of results with variations in treatment, site, secondary involvement, extent of operation, etc.) and the specific lesions about the face and mouth.